Animals and Sacred Mountains: How Ritualized Performances Materialized State-Ideologies at Teotihuacan, Mexico

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ABSTRACT

Humans have always been fascinated by wild carnivores. This has led to a unique interaction with these beasts, one in which these key figures played an important role as main icons in state imperialism and domination. At the Classic period site of Teotihuacan, Mexico (A.D. 1-550) this was no exception as large carnivores (mainly eagles, felids, canids and rattlesnake) were sacrificed and deposited as associated offerings in large-scale dedicatory rituals. This study investigates the zooarchaeological remains of nearly two-hundred animals found in offertory chambers at the Moon Pyramid and the Sun Pyramid to question: 1) What were the dynamic ritual processes that took place during the dedication ritual? 2) What changes do we see in the types of human-animal interactions with wild carnivores? 3) How did the participation of animals in ritualized activities lead to the concretion of a stratified sociopolitical landscape? And, 4) what were some of the meanings and functions behind the dedicatory acts? This project applies a multi-methodological approach integrating zooarchaeological, isotopic, and iconographic analyses interpreted in light of existing ethnographic, ethnohistoric, and religious studies literature. The dataset resulting from this dissertation provides the most comprehensive evidence of the central role animals played in rituals linked to monumentalism and state domination. Ferocious carnivores not only participated as victims of sacrifice and ritual paraphernalia, but were also kept in confinement in anticipation to the ritual slaughter. A shift in human-animal interactions, now characterized by dominance and control of the most powerful beast on the landscape, was central to creating a new perception of the animal hierarchy. The fauna deposited at these offering caches were social agents that helped negotiate and maintain social hierarchies, even ascribe meaning into the monuments themselves, through their participation in ritualized performances.

In memory of Kumiko Sugiyama

and

Dedicated to Saburo Sugiyama

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Chapter 1

Ritualized Animals at Teotihuacan

Animals were integrated into state-level ritualized performances as key actors throughout human history. This is evidenced by animal mummies in Egypt (Ikram 2005), large scale sacrificial chambers with entire horses buried with their chariots in late Shang palace district at Yinxu, China (Yuan and Flad 2005a; b), and other archaeological evidence from all corners of the globe (Goepfert 2012; Hill 2000; Klenck 1995; Russell 2012b). They partook in sacrificial rites, accompanied human burials, were killed in royal hunts, and were extensively used as elaborate ritual paraphernalia. This dissertation examines a concrete case study of mass dedicatory caches from the site of Teotihuacan, Mexico (A.D. 1-550), to understand how human-animal interactions directly contributed to the reification of social hierarchies in the context of state-level rituals.

Zooarchaeological remains were central components of dedicatory offerings in the two major pyramids, the Moon Pyramid and the Sun Pyramid. Animals partook in large-scale dedicatory rituals as victims of sacrifice and as ritual paraphernalia. At the Moon Pyramid, four offerings were deposited during the construction of new building phases that incorporated carnivores including felines, canids, serpents and eagles in its interior (Polaco 2004). At the Sun Pyramid, recent excavations of a new offering chamber uncovered a similar assemblage of carnivorous beasts as both prepared and complete individuals (Sugiyama, et al. 2013a). Together, over 190 animals were identified from such ritual contexts, representing one of the most ubiquitous evidence for animals deliberately utilized in state rituals from any single context during the Classic Period (A.D. 250-A.D.900). Such a large assemblage of animals embedded into dedicatory caches have only been found during the Post-Classic period (A.D. 900-1521) at Tenochititlan (Polaco 1991).

The materials analyzed in the present study are exceptional not only because of the quantity of animals represented, but also because of the rich archaeological context that permits spatial-temporal control to reconstruct individual animal bodies form each of the offertory complexes. Detailed information on not just body position, element representation, and species diversity within a offering, but also chronological trends in faunal usage are available. In addition, excavating complete animal cadaverous *in situ* permitted reconstructing not only the *chaîne opértoire*, the process of acquisition, preparation, use and deposition of each animal, but also individual life histories that includes human-animal encounters during its capture and maintenance within the city.

Problem orientation

Archaeologists have always struggled to address higher levels of inference through the archaeological record (e.g. Hawkes 1954). Extracting meaning behind ritual activities have particularly been approached with care. Here I propose that through detailed analytical work on faunal remains, rich biographies of the animals can be reconstructed. Through these reconstructions, it is possible to identify why the animals were selected in the first place and the underlying processes that converted these animals into state symbols. I ask four key questions during this reconstruction that are examined in light of the archaeological, analytical and comparative dataset.

1) What were the dynamic ritual processes that took place during the dedication ceremony? How did this ritual or set of rituals change over time?

My gateway into the present study were the faunal materials from dedicatory caches. Thus the majority of the dataset concentrate on the meticulous reconstruction of the ritual scene itself through the zooarchaeological and isotopic evidence. A detailed reconstruction of the dedicatory ritual itself allows us to gain a holistic understanding of the actors, the motive(s) behind the ritual, and how the audience would likely have experienced the event. Essentially it is through reconstructing the nodes of decision making about how the ritual was conducted and examining patterns amongst the animal assemblage that we are able to understand what attributes were important to express in a ritual performance. For example, what species were selected? Did the age and sex play a role in deciding which animals were appropriate for sacrifice? Was the quantity of animals a pre-determined attribute?

Specifics on how the animals were brought in (alive or postmortem), what the animals and faunal artifacts would have looked like (skinned or taxidermically prepared), how they were killed (buried alive or trauma), and even the seasonality of the event are all considered in this reconstruction. The faunal assemblage is interpreted in multiple scales looking at the overall ritual scene as a single unit, as well as their relationship with other dedicatory chambers throughout the two monuments. Thus variations in the ritual usage of fauna across time and space are also discussed.

In this context, the ritual process being reconstructed includes not just the event itself, but the long process of planning, executing, and terminating the ritual. It is important to distinguish between pre-determined aspects that required very specific faunal attributes (species, number, and gender) for the ritual to understand the challenges and hardships in programing the event. Such a time frame would have to consider the acquisition, maintenance, and in some cases the production of the faunal artifact during the preparatory stages. Investigating this initial period directly addresses the second research question:

2) What changes do we see in the type of human-animal interactions with wild carnivores? What does the variation expressed in these interactions mean?

As discussed above, the beauty of the present assemblages is that they speak not only to the reconstruction of the ritual scene itself, but that bone chemistry, pathologies and contextual data can access animal biographies that include the vivid encounters between humans and these animals. Bone pathologies tell histories of injuries, diseases and malnutrition that indicate that some of the animals were kept in captivity for prolonged periods of time. Furthermore, isotopic data provide another line of evidence, corroborating some animals ate a range of C_3 (natural) and C_4 (mainly maize, artificial) based diets.

Such conspicuous material records of active captive management of wild carnivores had not yet been archaeologically verified in Mesoamerica, and can only be compared to colonial documents that describe "Moctezuma's zoo" where diverse local and foreign wild fauna were kept in captivity over nine centuries after the decline of Teotihuacan (Blanco, et al. 2009; Nicholson 1955). Certainly the faunal assemblage was a heterogeneous one, with complex life histories that included animals that were hunted in the wild, and some that have evidence of varying degrees of captivity amongst both primary and secondary deposits. The question then is, did this difference in human manipulation and physical engagement with the live animal matter? Why were the Teotihuacanos electing to manage some animals, but not others?

Deeply rooted in this question is how animals are conceptualized by indigenous communities. Particularly, what was the backdrop of human-animal encounters from which this new type of physical interaction — not just directly observing the animal but confining and controlling its movement— was developed? In this dissertation I argue that this transition from a symbolic connection to the animal to a direct manipulation and even dominance over very specific powerful carnivores on the landscape was deliberate and crucial to reifying these animals into state symbols; an aspect that is questioned as follows: *3) How did the participation of animals in ritualized activities lead to the concretion of a stratified sociopolitical landscape?*

Dominant carnivores, especially the jaguars (*Panthera onca*), were mediators between sources of power, revered as the master guardian of animals, the ancestral spirits, the gods and the ultimate symbol of power and rulership (Benson 1972; Gossen 1975; Saunders 1998). Accordingly, they were often elemental icons of militarism and domination, playing central roles in elaborate state-level ritualized activities throughout Mesoamerica. So, what processes established these specific carnivores— the feline, the canid, the eagle and the serpent— as elemental symbols of the Teotihuacan state? I argue that their active participation in ritualized activities concretized these beasts into key symbols. This is evident from the repeated use of the same species in state rituals at both monuments at multiple construction phases; a pattern mirrored in the rich iconographic repertoire of Teotihuacan mural paintings (Berrin 1988a; Fuente 2006; Miller 1973). Such an interpretation particularly highlights the deep connection between ritualized practices as arenas where power dynamics are negotiated. Animals, as active agents in such ritualized performances, partook in the creation, reification and maintenance of the socio-political landscape during a time of rapid state expansion, urbanization and monumentalism.

I deliberately focus on the sociopolitical landscape because animals are essentially tied to their environment. Ethnozoological classification systems have established animal hierarchies deeply embedded into native cosmologies (Gossen 1975; McAnany 2008). Here I argue that natural hierarchies that placed carnivores at their pinnacle were utilized as a metaphoric parallel to the arising social stratification in the Teotihuacan valley. The state was drawing on traditional sources of power through these animals and, at the same time, radically revolutionizing a new type of interaction with these beasts through physical manipulation. During this process they created eschatological victims of sacrifice by vividly burying these powerful symbols alive, in the pyramids. This last point, that animal sacrifices of this nature were specific to dedicatory acts at major monuments, relates to the final question:

4) What were some of the meanings and functions behind the dedicatory acts?

This final question relates to a fundamental debate about defining rituals in the archaeological record. In the present study I focus on a very particular context and dataset to question what the participation of animals in dedicatory acts can tell us about their meanings and functions. In order to address this issue the full context of the dedicatory act must be considered. These offering chambers were part of the construction of monumental platforms at the ceremonial core of Teotihuacan, a center that became the navel of state ideology materialized into the ritualized landscape.

Taking advantage of the rich reconstructions of the ritualized processes (question 1), individual animal biographies (question 2), and the sociopolitical landscape (question 3) it is possible to begin piecing together the symbolism behind the dedication ritual themselves, as well as their role in the reification of the ritualized landscape. Can it be argued that animals were part of ascribing meaning to these monuments themselves? This dissertation particularly focuses on the Moon Pyramid as a monument where animals provide a possible key to decoding the monument's symbolism.

Chapter Outline

The dissertation can be divided into three components: the first three chapters focus on setting the stage (theoretical, contextual and methodological); the second section is composed of the raw dataset (zooarchaeological and isotopic); and the last chapter integrates the data with its interpretation. Three types of analytical methods were applied on the faunal assemblage: zooarchaeological analysis, isotope bone chemistry, and spatial analysis. Together these approaches are used to develop a narrative of the ritualization process. The robust theoretical, ethnographic and iconographic literature helped interpret this rich dataset, particularly in defining some of the key terms such as animal and ritual.

First and foremost, the theoretical framework from which data is collected and contextualized must be defined. In chapter two, two key concepts are introduced: ritual and animal. Rituals are interpreted as performances whereby religious ideas are transformed into social action. They are arenas where key symbols are established, where power negotiations occur, and the means by which these monuments were imbued with meaning and, defined as a central places in the dynamic ritualized landscape of Teotihuacan. For this specific context of state-level ritualized activities, this study examines the dedicatory caches as a performance and a process. The ritual event is considered as part of a longer process whereby it is part of, for example, the construction of a pyramid and its transformation into a sacred mountain.

The key to understanding animals within indigenous ontologies is that they were conscious, intentional agents and ontological subjects (Bird-David 1999; Hallowell 2002; Ingold 1988a; Viveiros de Castro 2012). Interpreted as such, ritualized performances were a central stage for developing meaningful interactions with these animals and empowering them into key symbols of the Teotihuacan state. Such a perspective brings human-animal interactions to the forefront, suggesting that transformations in this type of encounter have very specific implications in the social landscape. It is at this point that there is a distinction made between animals that were "sacrificed", entering the ritual scene alive to be deposited as a primary burial, and those that were ritual paraphernalia, faunal products that were secondary deposits. What distinguishes the sacrifice from other faunal products is that individual animals were "set apart", consecrated into the ultimate victims appropriate for sacrifice. In comparison, animal bodies often referenced the animal group or category, alluding to the whole. Thus while extensive manipulation occurred, it often was not individualized in the same manner required in sacrifice.

The third chapter of the dissertation situates the rituals within the natural and socio-cultural context of Teotihuacan. The three monuments at the ceremonial core (the Moon Pyramid, the Sun Pyramid and the Feathered Serpent Pyramid) are introduced together with the data known about the building phases, excavation context and established chronology. Particular details about the dedicatory context including other associated artifacts, the location they were found, and established dates are presented. It is at this point that the four offertory contexts — Entierros 2, 3, 5 and 6 from the Moon Pyramid and Ofrenda 2 from the Sun Pyramid — are introduced in spatial-temporal relation to each other.

Chapter four introduces both the zooarchaeological methodology and the animals that are the subject of the dissertation. This includes details on the standards utilized for taxonomic identification, age and sex designation, methods for recording element distribution and surface modifications, and calculations of the minimum number of individuals (MNI). Surface features were highlighted for interpreting taphonomic processes, preparation methods, and pathological indicators of injuries, disease and malnutrition that can illuminate the presence of animal confinement. Here a quick summary of zooarchaeological research at Teotihuacan is given as a backdrop to compare the species representation from published data throughout Teotihuacan with that found from specialized offertory contexts analyzed in the present study. Each of the main actors present in the offerings are introduced including the animals' biology (species diversity, ecology and behavior); how species, age and sex determinations were conducted; a summary of the species' presence in Teotihuacan's zooarchaeological record, and; an overview of its symbolism within the greater context of Mesoamerica.

Once the theoretical, contextual and methodological background are provided, chapter five begins to present the raw dataset. Zooarchaeological data were divided into two chapters: chapter five focuses on primary burials and the subsequent chapter discusses the secondary burials. I begin by defining the overall faunal evidence, including the species abundance, distribution, age and sex profiles, and significant surface modifications. As complete cadavers, aspects of reconstructing how the animal was sacrificed are particularly dealt in depth. This chapter also presents detailed descriptions of the various pathologies recorded, including several injuries that would have been fatal in the wild. Such data is presented to demonstrate evidence of captivity. When available, the stomach contents of these primary burials were also analyzed that helped construct a narrative of the sacrificial victim.

Unlike primary burials, secondary deposits described in chapter six focus on the ritualized production of animal paraphernalia. I question: which animals were selected and whether this selection was distinct to that applied to primary deposits; when did producers access the raw material (fresh kill or post-decomposition); how standardized was the production process; are there chronological trends in how animal products are manufactured; were these animals also managed prior to production; what elements were utilized; and what did the end product look like? This chapter particularly focuses on the overlap analysis of both element distribution and surface modifications to calculate MNI and processing techniques. Lastly interspecies and chronological trends are considered, including observations of a comparative example of maxillary pendants found from the Feathered Serpent Pyramid offerings (Valadez Azúa, et al. 2002a; b), to understand the heterogeneous manufacturing techniques applied at the Moon Pyramid and Sun Pyramid.

A second methodology, isotope bone chemistry, and resulting dataset are presented in chapter seven. The data focuses on paleodietary reconstructions of felids, canids, eagles and rabbits of both primary and secondary burials in order to recognize the presence of artificial diets. The zooarchaeological evidence presented in chapters five and six highlighted the possibility that captive management of carnivores was occurring at Teotihuacan. This isotopic investigation provided an independent line of evidence to confirm this hypothesis. The chapter begins with an introduction of the elements analyzed in the present study — carbon, nitrogen and oxygen — as well as a model of how to test for the presence of an artificial diet. Details on the sampling strategy and methodology, including the criteria for assessing diagenesis are presented. Finally, the raw data for each of the animals examined (felids, canids, eagles and leporids), as well as the overall isotopic patterns are discussed. This last component includes patterns of primary versus secondary burials, between dedicatory contexts, as well as a case study of both teeth and bone samples from a single individual.

Up to this point, most of the data was presented by animal categories, then by the offering context. Chapter eight brings all the information back to the dedicatory cache to look at overall patterning (particularly spatial layout) in the faunal assemblage. Species diversity, spatial patterning and seasonality are considered for each context to determine overall chronological parallels and differences. Each feature highlights a distinct aspect of the ritual performance: species diversity pinpoints key actors of the ritual spectacle; its spatial distribution informs how animals oriented the ritual scene and what attributes were important factors in this process (age, sex, species); while their seasonality can determine when the event likely took place. Finally at the end of this chapter the zooarchaeological and isotopic data are summarized to create a model of the ritualization process, recreating how a wild animal was either transformed into a victim of sacrifice, or prepared ritual paraphernalia.

As the conclusion, chapter nine brings the discussion back to the core arguments presented in chapter two: the ritualization process in constructing animals as state symbols. I review how sacrificial animals were constructed, how ritual paraphernalia were produced, and lastly, the central role of dedicatory caches in the ritualized production of the monument itself. I argue that the construction of Building 4 of the Moon Pyramid was when this transformation into key symbols occurred as live animals were embedded into the pyramid. In subsequent offerings there was a transition from a focus on animals ordering the ritual space through embedding sacrificed animals, to an emphasis on human sacrificial victims and animal products being utilized to construct the identities of these humans. In sum, I highlight the central role of human-animal interactions in defining the sociopolitical landscape.

CHAPTER 2

Theories: Animals in Ritualized Performances in State-Level Societies

Two key concepts highlighted in this chapter are essential to our understanding of the role of animals in state-level rituals at Teotihuacan: 1) the dedication rituals conducted at the ceremonial centers were *ritualized performances* organized by the Teotihuacan state and, as such, were active arenas for the construction of a hierarchical social landscape; and 2) Amerindian communities granted *agency to the animals* that were participants in such ritualized activities. It is my thesis that the Teotihuacanos engaged in interpersonal relationships with these animals to transform select fauna into empowered symbols that animated key features on the landscape. This chapter disentangles and contextualizes the two key factors that define the interpretive framework utilized throughout this study: the ritual and the animal.

In this chapter I begin with a brief discussion of the definition of ritual, and argue for the use of a performative approach. Such an approach highlights several key features applicable to the present case: the use of empowered symbols to reify asymmetrical power dynamics, the production of place (setting) where such actions literally take (and make) place, and the focus on bodily movement and interactions of participants. I employ this approach to define the material correlates that define how animals were converted into empowered symbols, delineate how animals participated in the production of places through their incorporation into the monuments, and finally, attempt to understand what an animal is, as Ingold (1988a) has questioned. Such an inquiry must begin with a discussion of “perspectivism”, the understanding of animals in a relational ontology endowed with personhood (Viveiros de Castro 2012). It is the interpersonal relationships, both symbolic and physical, that humans have with animals that help formulate the social identity of the animal in question. Thus, I argue that a zooarchaeological examination of both animal victims selected for sacrifice and the embodied remains of animal products from dedicatory caches is an effective way to discern the role of animals in the construction of the social landscape at Teotihuacan.

The Ritual: Definitions and Interpretive Paradigm

There are as many ways to define ritual as there are contexts where ritualized activities take place. The purpose of this chapter is not to come up with a comprehensive universal definition of ritual, but to describe the particular context in which ritual activities at Mesoamerica's largest city is interpreted. Only one type of ritual activity — those associated with state-level ritualized activities — and one agent is the focus of the present study — the animals that participated in these activities. The particular connection these rituals have to the Teotihuacan state already defines one of the key components that must be addressed: the relation of ritual to power, particularly in the formation of a dominant state ideology. The material traces being analyzed (zooarchaeological remains) suggest that we are looking at the physical traces of animal bodies and body parts. Therefore the role of the body in a ritual is also discussed. Lastly, we should take special cognizance of the context in which these rituals were conducted, the physical place on the landscape and how rituals are utilized to define them. Before diving into these specific aspects of ritual, I provide a brief overview of the trajectory and overall patterns of how rituals and religion are discussed and defined for the purposes of my analysis. This is in no way a comprehensive survey, but provides the background to structure how the present study interpreted rituals.

One major point of contention in the anthropological literature is the relation of ritual to religion. While some do not agree that rituals must necessarily be religious and focus instead on repetitive actions (Kyriakidis 2007b; Marcus 2007), the present study concentrated on particular acts that directly referenced aspects of how their world view was organized. In fact, it is argued that these ritualized acts were among the foundational means by which their understanding of the world around them was physically materialized into the cultural landscape through the construction of a ceremonial center, the creation of a cosmovision, and of a cosmogram (Carrasco 1990; Sugiyama 2010). Instead of trying to interpret belief systems – the religious – this study concentrates on ritual because rituals are a form of practice that leaves material traces and more readily pin-points the underlying processes that create, maintain and reify these belief systems. However, because of the religious nature of the present context, discourses on how traces of the belief system can be identified archaeologically need to be clarified.

In analyzing rituals, an appropriate place to begin is with how rituals are defined. However, many researchers have actively rejected universal definitions of ritual, suggesting instead that they should not be defined at all. Some argue from the perspective of contextual archaeology or historical particularism, that each ritual needs to be understood within the appropriate historical and contextual framework and any universal framework would be too general or all-encompassing to be useful (Bell 1997; Insoll 2004; Kyriakidis 2007c). In this view, each ritual should stand in its own "thick context" (Insoll 2004:12), defined by the society that practices it, a perspective that requires ritual to be analyzed only within the appropriate social, historical and material context (Kyriakidis 2007c). In contrast, very specific definitions of ritual based entirely on a contextualized example can be too narrow to be utilized anywhere else, and thus meaningless in the context of greater anthropological discourse (Smith 1998).

Others reject defining ritual altogether (e.g. Bell 1992; 2005). This is because ritual, and particularly religion, are the products of a scholarly discursive process, created for an intellectual purpose (Asad 1993:116), and thus comprise *etic* categories. However, one can argue that because ritual is an interpretive term created by scholars, it is theirs to define and is amenable to the particular contextual situation as well as the interest of the scholar (Smith 1998). I am comfortable with a multiplicity of definitions while still acknowledging the need for a delineation of the term. As Kyrakitis (2007a) rightfully points out, each researcher should define ritual within the archaeological and theoretical context in which their study interprets ritual. Thus, instead of going through a historical overview of how ritual and religion have been defined (see Bell 1992; 2005 for an overview), I briefly examine the broader theoretical frameworks from which rituals have been defined, to formulate the appropriate definition for the present study.

According to Fogelin (2007), there is a dichotomy between religion/ritual and belief/action and there are two broad interpretive frameworks utilized that focus on one of these aspects. Structuralists value religion as a primary framework and believe rituals function to enact religious beliefs (Fogelin 2007). In this paradigm ritual is a complex symbolic communicatory system that encodes cultural values and a sense of social order. Such an interpretation assumes a degree of stability and continuity between religious ideas and ritual acts (e.g., Bloch 1986), allowing for use of historic and ethnographic sources for understanding belief systems. Particularly useful in such frameworks are the interpretation of myths, where rituals are argued to be reproductions of such oral traditions that encode underlying social structures (Eliade 1954; Lévi-Strauss 1979). Geertz (1973) argues that symbolic meanings are embodied, (re)formulated and reinforced though the ritual act. Such an understanding assumes symbols as extrinsic sources that are beyond the boundaries of the individual organism to manipulate. However, his analysis was criticized because such an interpretation undermines the processes through which such meanings were constructed and does not allow for change (Asad 1993:123).

On the other hand, practice theorists highlight rituals as the key interpretive concept. Downplaying the meaning behind the ritual, they ask what rituals *do* through focusing on the actions of individuals (Fogelin 2007). Beginning with Durkeim (1915), there has been an ongoing discussion on the functional and social aspects of religion as a means of social cohesion – as a glue of mechanical solidarity though the church. Practice theory approaches to ritual build on this concept, but further argue that it is integrative action, not collaborative thoughts, that produce communal solidarity (Inomata 2006). This theoretical framework gives agency to individuals who construct, maintain or modify religious beliefs though ritual acts that cause social changes (Bell 1992; 1997). Such an interpretation advocates for a creative or potentially revolutionary aspect of ritual (Fogelin 2007). Bell (1992) utilizes *ritualization* to distinguish rituals as more a process than an event, and argues that such processes are the paradigmatic means of sociocultural integration, appropriation, or transformation. Such frameworks are effective in understanding rituals as a means that constructs and reifies social boundaries, particularly in the contexts of changing sociopolitical organizations (Bell 1997; Flad 2001), but often do not allow us to examine the meaning behinds actions and symbols.

It is important to define what theoretical stance is utilized before offering the interpretations because it define the scale of study, the assumptions utilized, what data are analyzed and the way rituals are defined (Fogelin 2008:11). Structuralists that focus on meaning are intrinsically interested in long-term symbolic meanings that are to some degree static. They often rely on historical and ethnographic datasets in relation to archaeological correlates, particularly, symbolic connections such as those that can be observed through iconographic analysis, to understand the underlying belief systems in operation (Betts, et al. 2012; Busatta 2007). On the other hand, practice theorists focus on the actions of individuals and how ritual changes may be linked to sociopolitical transformations in ancient societies. They focus on reconstructing how the actions of individuals have changed over time and are often linked to changing power structures, such as the rise of hierarchical societies (e.g Flad 2001).

Unfortunately this dichotomy has many pitfalls for understanding rituals. On the one hand, structuralists are often under the illusion that there was ritual stagnation wherein meanings are unaffected by the dynamic sociopolitical context of the time. On the other hand, practice theorists can interpret rituals as "hyper-active", sometimes undermining the consideration that they operate within the "durable, adjusted dispositions" within the *habitus* (DeMarrais 2004:12). The *habitus* represents the underlying structuring mechanisms that give permanence, at the same time allowing for creative innovation and variability, making them effective forms of action (Bourdieu 1977; Wacquant 1992:18-19). In practice, most researchers do not follow strictly structural or practice-oriented approaches, often juggling insights from both perspectives (Fogelin 2007). But, as Fogelin (2007) rightfully points out, this is often the product of simply side stepping these theoretical constructs. There is a need for a more explicit attempt to attain a more nuanced perspective, allowing researchers to examine the dialectical interplay between belief and action.

One way to overcome this dualistic perspective is through focusing on the ritual act as a performance – a culturally constructed system of symbolic communication that is experienced through the physical body (Rappaport 1979; Tambiah 1985; Turner 1986). Performance theorists focus on the active and communicative aspects of rituals, allowing scholars to interpret them as both a form of action, and thus a process, while recognizing that they express meaning (Bell 1997; Inomata 2006; Inomata and Coben 2006). As such, the dialectic intercourse between meaning and practice is established in a religious spectacle. Here I briefly discuss several characteristics of ritualized performances: 1) they are experienced, 2) they convey meaning, 3) they include participants (actors and observers), 4) they take place in a particular setting, and 5) as rituals, these performances have very viable implications to the social identity of the group.

1) Performances are experienced

So, why are experiences such an integral component of rituals? This is because anchoring the social identities, traditions and value systems of a community to tangible images and actions that are experienced is an effective strategy for the solidification of these concepts into the social memories of the individuals (Inomata 2006). Rituals are experienced through emotive and somatic means, and it is through these multifaceted sensory experiences that ritual acts reinforce and authenticate the underlying values (Dornan 2007). Thus, some researchers have focused on this sensual aspect of the ritual to reconstruct how individuals would have experienced the ritual (Houston and Taube 2000). For example, some use cognitive archaeology, exploring neuro-scientific approaches to understand human experiences through understanding the inner workings of the brain (Dornan 2007; Renfrew and Zubrow 1994; VanPool 2009). Others discuss sensual ritual experiences as defined by bodily movement, thereby conveying directionality and spatiality as key features in the ritual experience that can be investigated through the natural or built environment (Moore 1996; Parkin 1992). While the present case cannot reconstruct human-sensual experiences, it focuses on the physical experiences of the participant animal as a key aspect of the ritualized process, through the detailed reconstructions of the animals' life histories.

2) Performance conveys meaning

In analyzing a ritual, we must ask what is being communicated. While performance theorists do not simply assume that pre-existing symbolic values are transmitted – in fact they argue that new and revolutionary values could form – they also acknowledge the underlying traditions from which such ritual actions are formulated (Inomata 2006). Both indexical (self-referential) and canonical (cultural tradition) values are created, manipulated, maintained, reified, and accepted through these actions (Rappaport 1979; Tambiah 1985; Turner 1986). Many of these may be identified as "key symbols" that both summarize and elaborate concepts, through root metaphors or providing key scenarios, that orient the sociocultural value systems through the ritual act (Ortner 1973).

Some say syntax (the form or way the ritual is enacted) is more important than the semantics (the content and meaning), as the former restricts the latter (Bloch 1974). However, several researchers argue that there is a dialectical relationship; while syntax (form) shapes semantics (meaning), semantics constrains ritual syntax (Inomata and Coben 2006; Tambiah 1985). Thus any understanding of meaning would inherently have to investigate the form in which these meanings are formulated, manipulated, and embodied, an aspect that is more readily observable through the archaeological record. The first steps in this process would be identifying key symbols in a ritualized performance, contextualizing this symbol within the traditions of that group, then looking at the way in which these symbols were produced, controlled and reified within the particular ritual in question.

3) The participants

The performance model brings the participants of the spectacle – actors and audience – into the forefront. Participants actively reinterpret value-laden symbols that are, at the same time, communicated to – and by – the participants (Bell 1997:73; Inomata 2006). Some theorists place particular attention on the need for an observer/audience, whether supernatural, human, or non-human (natural) (Inomata and Coben 2006). Performance theory allows for a degree of emotional variance in the participants, ranging from indifference or resistance to active participation (Bell 1997; 2005; Inomata and Coben 2006:15). Such a perspective allows for individual autonomy, while still successfully constructing a sense of community and reifying social relationships. The physical presence of the participants, as the body moves within the specially constructed stage, both defines (imposes) and experiences (receives) the values ordering the environment (Bell 1997:82). To clarify, it is not the intent – the active decisions made by the individuals – that involves them as part of the ritualized process, but rather the physical presence within the ritual, that defines participants as agents within the ritual. It is participation in these acts that forms social identities and defines social relations among the participants (Inomata 2006). This discussion is particularly relevant in discussing non-human participants, as intentionality cannot be assumed in their involvement. However, as I argue here, their participation and their physical presence in the ritual made them essential actors and key symbols in the definition of social relationships.

4) *The setting of a ritual performance*

Performance theorists are invariably concerned with the setting, i.e. the materiality of space and associated objects, in which these practices occurred (DeMarrais 2004; DeMarrais, et al. 2004; Inomata 2006). This can be through explicitly referencing particular landscape features, both natural and artificial, that effectively materialize social institutions because of their scale, visibility and permanence (Earle 2001). Indeed, the long preparatory processes of a ritual need to be integrated within the discussion of a ritual spectacle, and the creation of the ritual space – monuments, plazas, and palaces, and other public spaces – were an integral part of this process (Inomata 2006; Inomata and Coben 2006; Joyce 1992). Considered part of the ritualized spectacle, the construction of these locations was also an effective means of physically manufacturing an ordered space that is critical to the way ritual performances are experienced (Inomata and Coben 2006). The setting defines the physical properties and the communicative potential of the performance such as the scale, the centrality, the trajectory (route), the acoustic properties, the lighting, the visibility and the permanence (Inomata and Coben 2006; Moore 1996). At the same time, as a constructed space, it can be meaning laden often materializing dominant ideologies (Broda 1988; DeMarrais, et al. 1996; Fash and Fash 1996; Sugiyama 2010; Wheatley 1971). As the present case discusses the role of animals in dedicatory caches embedded within the monumental structures at Teotihuacan, I argue that the dedicatory rituals performed were part of the production process of creating key places that were embedded within the social landscape of Teotihuacan. In the case of the Moon Pyramid (discussed below), there is a direct relation of animals to the definition of the monument as a sacred mountain, an *alteptl*, that provided a basis for social cohesion.

5) Implications of a ritual performance

Returning to the initial intent of defining rituals, the present case of state-sponsored rituals are interpreted as the process by which religious ideas are transformed into social actions through performances. While this definition highlights the importance of ritual actions, in accordance with practice theorists, it still allows us to interpret the religious aspects of the ritual, and thus how their conceptualizations of time and space as communicated through the performative act. I also argue that the performance of these actions, experienced through the physical body, is the means through which meanings and structures are embedded into the sociocultural landscape.

A performative approach to ritual requires that attention be paid to the processes of embodied acts, material and spatial contexts, and interactions between actors and observers (Inomata 2006). Investigating the theatrical components of a ritual permits understanding the communicative potentials of the performance, evaluating how meanings are constructed, and assessing the emotional impact of the participants (Inomata and Coben 2006). It pays particular attention to the materialization of the body (participants-actors) and space (physical location-stage), as the active arenas that define and are defined by the ritual acts. Archaeologically, performance can be seen by investigating the form, context and process of the theatrical event. This includes the formal properties of the events, the physical actors of the performance, and its material and social settings (Inomata and Coben 2006) .

Performances, particularly state-level spectacles, were a particularly efficient means of integrating and forming a community that was the backdrop for imposing and negotiating asymmetrical power relations (Inomata 2006; Inomata and Coben 2006). For example, Inomata (2006) has shown that state-sponsored mass theatrical events held in large open public spaces were the mechanisms that integrated Maya communities that authenticated and reified their community and their identity (cf. Fash and Fash 1996). Similarly, the dedicatory rituals that would have accompanied the construction of the monuments at Teotihuacan would have been one of the centrifugal forces that led to the success of Teotihuacan's highly differentiated social structure. In the following sections I highlight two specific aspects about ritual performance: 1) the role of state symbols in the reification of power structures and 2) how the construction of place was particularly pertinent in understanding where these symbols and actors are located within the sociocultural landscape.

Ritual and Power: The Creation of State Symbols

Understood as an arena for the construction and the communication of social boundaries, ritualized acts have been an effective place to examine the relationships between ritual and power. In the full range of hunter gatherer, forager, hierarchical and state societies, rituals have been argued to stabilize and reinforce new social boundaries, such as the rise of new sociopolitical organizations, in diverse historical, regional and social contexts (e.g. Aldenderfer 1993; Flad 2001; Laneri 2008). Particularly, state-level ritualized activities have been argued to be a critical means for institutionalizing and empowering the state (Kertzer 1991). It is in these rites that institutional facts may be brought into being and then repeatedly affirmed, helping to maintain social order (Renfrew 2007:118-119). Ritual empowers those who control the ritual spectacle – they can define the logistics of and who can participate in the ritual – giving them access to esoteric knowledge and authority (Bell 1992; Fash 1991). Here, I argue that the construction of highly effective state symbols, the manipulation and control over these symbols, and the materialization of such symbols that are embodied and experienced through state ritual spectacle were central to reifying and legitimizing the state. One such case can be argued for the use of animals as state symbols, and are the subject of this dissertation. But first, we must begin by defining how symbols were central to this process and how ritual spectacles were the means for the reification of such symbols.

Kertzer (1991) argues that the creation of symbols is the only way religious organizations – church or state – can be "seen", becoming the medium for drawing social affinities. Rites are a means by which such images are created, modified and reified and link them to emotionally charged social action, binding the symbols and what they represent to the people. At the same time, rituals are built out of such symbols that define their understanding of the world (Kertzer 1991). A successful state ritual makes this bridge between these empowered symbols and the state, making the participants embody the newly created world order that is exemplified by the symbols themselves.

An effective symbol has both a strong ideological backing, often drawing on traditional, long held belief systems, and an effective outlet, whereby it can be materialized and experienced most conspicuously in state-level ritual performances. Such symbols deliberately lay out their world order and at the same time link this order to the values and forms of the present social organization (Bell 1997:136). In particular in the rise of new political systems the ruling class utilizes traditional ritual forms and symbols that make it easier for personal affiliations to develop (Kertzer 1991). This is why later large empires often continue to draw on the glory of past civilizations through re-utilizing, sometimes re-excavating, powerful symbols. For example, the Aztecs excavated and employed old artifacts and reproduced ancient art styles (for example in the architectural styles), drawing on the conception of an origin from the glorified utopian past, that was most vividly exemplified at the ceremonial center of Tenochitilan (López Lujan, et al. 2000; Matos Moctezuma 2002). In this manner salient symbols from past civilizations were drawn on to create the imperial ideological regime (López Lujan and López Austin 2009; Mastache, et al. 2009).

Empowered symbols are materialized through the ritualized process. It is when symbols take concrete, physical form, that they can be identified, seen and experienced, allowing for an ideology to take on a physical manifestation (DeMarrais, et al. 1996; Robb 1998). However, such symbols were rarely made of a single concrete set of meanings, but were polyvalent, fluid and hybridized, created, transformed and maintained through social actions (Sahlins 1981). Interpreting symbols as permutable emphasizes the importance of understanding the process in which these symbols were incorporated into the ritualized experience, which can only be attained through a contextual analysis of the micro-scale experiences (Robb 1998). As archaeologists, we must attempt to reconstruct how participants observed, came into contact with, heard, smelled and felt the presence of symbols.

Such symbols can be objects, such as the crown, or subjects, such as the Emperor of Japan. Once a symbol is materialized, these symbolic objects/subjects can be a vessel for manipulation and control (Fogelin 2007). For example, it is only when a flag takes on the identity of a nation that it can be used to demonstrate social affiliation through hanging it in front of one’s house, or can be used to demonstrate revolt by burning it. There are several means of manipulating and controlling symbols. One of them is through controlling access to the symbol or restricting the use of such empowered symbols (Fogelin 2007). There is only one crown, and that is housed in the royal palace and can only be worn by one individual. As such, mapping the distribution of these symbolic objects/subjects can be efficacious in an archaeological case study. Another form of control is through the physical manipulation of the symbol, changing either the physical properties of the symbol (burning it) or the relationship between the symbol and the institutional authority in question (one symbol becoming dominant/subordinate to the other). The manipulation of a material symbol can transform the meaning of the same symbol (Fogelin 2007), and it is through observing the transition in how symbolic objects/subjects are manipulated, that their underlying meaning may be visible in the archaeological record.

Once a symbol is constructed, it must be constantly affirmed and maintained through the performative act (Inomata and Coben 2006). It is highly visible, abundant, and recognizable, but also highly restricted to specific contexts. In many cases, symbolic material objects would remain as memory reinforcing mechanisms in performative acts. For example, royal Maya elite constructed monumental texts not only to historically record royal history, but also as visible markers of the ritualized activities that took place during the placement, creation and activation of ritual things and places (Stuart 1998). Similarly, the elaborate mural paintings and stone sculptures from Teotihuacan that reference these symbolic forms may be potential archaeological indicators for how these empowered symbols were viewed by the public.

As Robb (1998:341) rightly points out, we can't have a "Rosetta Stone view of figuring out meaning"; there is no simple methodology to code break every symbol. However, there are specific experiences/processes that are easier to reconstruct archaeologically than others, and provide a good starting point to ask the appropriate questions. To begin, symbols are constructed in the same way their material correlates must be produced. One way to investigate how dominant symbols are constructed is through reproducing the production processes of the symbolic objects/subjects themselves. The production of these materials are themselves often loaded with ideological meaning (Flad and Hruby 2007; Hruby 2007; Inomata 2001; McAnany and Wells 2008) and untangling the way people produce and interact with these symbolic objects/subjects is an effective place to begin. Two aspects of the production of symbols are analyzed in the present case. First, I examine the role that the dedicatory rituals played in the construction of meaning-laden monuments. Then, I focus on how the identity of one of the participants in offertory spectacles — the animals utilized in these caches — was formulated through reconstructing the life histories and the physical experiences of the animals.

Ritual Spaces: The Production of Place

It is apparent that the ceremonial landscape at Teotihuacan was a materialization of the builders' cosmogram, encoding their conceptions of time, history and world order most conspicuously in the monumental structures (López Austin, et al. 1991; Šprajc 2000; Sugiyama 2010). Such a powerful state ideology, graphically materialized into the ceremonial landscape is said to be one of the main drivers for Teotihuacan's expansion into one of the largest metropolitan centers of its time (Cowgill 1992; Sugiyama 2005). Thus, paying particular attention to how these ideologically charged monuments – central to the concretion of state ideology – were constructed, is critical for understanding what made this ceremonial center so effective. In this dissertation, I attempt to view the theatrical event marked by the dedicatory caches as part of the ritualized production of place, animating the monument within its complex sociopolitical landscape. In order to explain this process, I must first define place, explain how ritualized production is an effective way to examine how places are formulated, and discuss how the performance of dedication rituals would have been central to the production of a monument as a place. The Moon Pyramid is used as the case study for this analysis.

Defining ritualized places

In the present analysis, places, unlike mere locations, are endowed with value and significance, situated within the complex sociopolitical landscape through historically contingent process (Carrasco 1991a; Knapp and Ashmore 1999; McAnany 1998; Smith 1987b). Places differ from locations that are void of the specific contextual processes and meanings attributed to a place. As part of the encultured landscape, places convey how subjective human experiences transformed the land into a nested web of meanings that becomes the canvas for space and place to be constituted within the social and cultural histories that construct political landscapes (Smith 2003). Much of the research concerning landscapes that examine city-planning, urbanization, and architecture has been interpreted as a sacred geography that organized the social-political order through the materialization of the cosmologic order (Ashmore and Sabloff 2002; Bernal-Garcia 1993; Brady and Ashmore 1999; Broda 1988; Fash and López Luján 2009; Reese-Taylor, et al. 2001; Vogt 1981; Wheatley 1971). They identify key places on the landscape that make them historically contingent, recording political, especially dynastic histories, and which are meaning laden and linked to social identities (Ashmore and Sabloff 2002; Broda 1988; Fash 1998; Fash and Fash 1996; Houston 1998; McAnany 1998). They replicate the cosmos, aligning monuments to specific astronomical alignments (Aveni and Hartung 1986; Šprajc 2000), and even the dimensions of these monuments can be embedded with highly significant numerical cues (Clark 2010; Sugiyama 2010). They also reference central mythologies that encode social norms and underlying structures, and are apt to be recounted and remembered physically through the theatrical reenactments at these locations (Basso 1996; Eliade 1954; Matos Moctezuma 1999; Townsend 1982). For example, the Huitzilopochtli temple, one of the twin temples at the ceremonial center at Tenochititlan, is interpreted as a replication of the mythical mountain of Coatepec where this patron god was born (Carrasco 1988; Townsend 1982). In the myths it was at this mountain that he sprang from the womb of his mother, and then ferociously sacrificed many gods, including his sister (Coyolxauhqui), as his first act of life. It is from this mythical mountain that sacrificial victims are said to be slain and tossed down the temple steps in the same manner that Coyolxauhqui met her fate (Durán 1971; Matos Moctezuma 1999). It is the mythical retrieval, recounting the apocalyptic beginning, that accordingly fueled the Aztec sacrificial ceremonies for regaining order, place and stability which fueled the imperialistic state (Carrasco 1988).

Taken in this manner, landscapes must be identified as consisting of nested places, embodying time, identities, events, and actions at varying scales (Hirsch and O'Hanlon 1995; Knapp and Ashmore 1999). They must be analyzed as layered conceptual topographies including their political, economic, ideological and natural topographies that generate a complex geographic heterarchy (Flad and Chen 2013). As a built environment, cultural landscapes organize space, time, meaning, and communication (Rapoport 1994; Smith 2003). There has been a growing interest in the interpretation of places, particularly as dynamic entities that serves as mediums, rather than containers, for action (Tilley 1994). In discussing the Mesolithic/Neolithic monuments, Tilley (1994) traces the transformation of encultured landscape when Megaliths were constructed as an indicator of how significance of place was understood – from the monument being set in the landscape, to the landscape being the setting of the monuments.

There are several ways that places become endowed with meaning. These include through their creation, maintenance, transformation and destruction. Each of these processes is marked by individual actions, by the events and activities that serve to "take place" (occurrence/maintenance) (Kyriakidis 2007a; Smith 1987b), "change place" (transformation) (Carrasco 1991a), and "make place" (production) (Brück and Goodman 1999). As a form of social action and production, they too are amenable to the social processes discussed in the present case of a ritual performance.

The link between places and ritualized performances is apparent, as the spectacles would have concretized the significance of the built environment within the social memories of the participants (Kyriakidis 2007a). At the same time, the ritual performances renew, even transform, the cognitive space within the memories of the participants as places are created, maintained, transformed and destroyed. The physicality of place — its size, location, orientation, acoustics, visibility — contributes to the experiences that reflect the intentions and ideas of the creators (Inomata 2006; Inomata and Coben 2006; Moore 1996). It is the concrete properties of the place that would have defined the social relations of the participants (Bradley 1998). Thus, the physicality of the space, tangible in the archaeological record, can lead to fruitful interpretations of the meanings and intentions of the dominant ideology. In the present case, I explore one type of place — monuments — and look at one type of ritualized performance — dedicatory rituals — to understand the ritualized production and maintenance of monuments as sacred places at Teotihuacan.

Ritualized production and monumentality

Interpreted as part of the ritualized process, creating the stage was essential to orient what was a foundation for Teotihuacan's highly successful ideological regime. Central to this landscape were the monumental structures that vividly dominated the landscape as key symbols of state imperialism and domination. Monuments are particularly effective in expressing unambiguous messages of authority and power and as a core feature in orienting their builders' cosmological order and social identity (DeMarrais, et al. 1996; Fash and Fash 1996; Fash, et al. 1992; López Austin and López Luján 2009; Moore 1996; Sugiyama, et al. 2013b). Furthermore, central pyramidal structures are defined by their monumentality, making them vivid, active, and dominating over the *longue durée*, transformative within the sociopolitical landscape of the time (Fash 2013; Sugiyama, et al. 2013b). They often served as the *axis mundi*, the core of the encultured landscape that venerated powerful ancestors and stood as the meeting place between different cosmic layers (Carrasco 2000; Eliade 1954; Freidel and Schele 1989; López Austin and López Luján 2009; McAnany 1998; Wheatley 1971). The ceremonial center most vividly characterized by these monuments, would have been the stages in which ritualized performances would have continuously been conducted to construct, maintain and transform the meanings of these places. Monuments are, “the remains of social experience and social strategies” (Wright 2006:194). This is why investigating the production of monuments is a particularly effective means of untangling the underlying intentions of the structure as well as how the sociopolitical landscape changed over time.

The first question to resolve is how a monument is produced. This includes not only the physical properties of the building project, such as the procurement of resources and the organization of labor (Murakami 2010), but understanding the ritualized production of a monument. This production sequence includes actions not related to the “basic necessities” of production (Hruby 2007:70) such as magic, chants, prayers, dances, feasts, sacrifices, and other performative acts that do not increase the efficacy or the aesthetics of the final product. This includes a complex process of sanctified actions that followed a series of rules and regulations that were believed to lead to the success of its production. For example, interpreting the African metal smelting technology in Malawi had to include the practices of using “magic”, not directly linked to the physical properties of the metal or smelting procedures, but that were culturally regarded as essential to the success of a smelting episode (van der Merwe and Avery 1987).

Thus, we must first understand what the ritualized production process of monuments encompassed, keeping in mind that conceptualizing monuments and production were very different in Amerindian societies. As was the case for animals (discussed below), Amerindian societies perceived palaces, temples, monuments, and other architectural features as animate beings (Mock 1998). As such dedication rituals were required to animate a structure, making it safe to inhabit or use, and termination rituals were employed to de-animate and discard one from use (Freidel and Schele 1989; Joyce 1992;

Marcus and Flannery 1994; Monaghan 1998; Stross 1998; Vogt 1998). For example, Vogt (1998) describes how the construction of a new thatched-roof, wattle-and-daub house at Zinacatán required the performance of two rites, the "binding of the head and roof" (*hol chuk*), and "holy candle". As such, the ritualized production of architectural features encompassed an extremely complex set of actions that inaugurated this structure, such as a ritual meal, animal sacrifice, dedication rituals, and various other performative acts (prayers, music, and processions). Epigraphic evidence from the Maya region also provides another line of evidence concerning how structures were animated. In fact, most epigraphic texts in the Maya region served a dedicatory function (Stuart 1998). For example, the panel of Structure 23 from Yaxchilán records the ritual activation of Lady Xook's structure through ritual activation via a dedication ceremony (known as *och-k'ak'*) (McAnany 2008; Plank 2004:51).

In the case of constructing a monument like the Moon Pyramid, archaeological data demonstrate conclusively that dedication rituals were an integral part of its sanctified production. Dedication rituals were conducted at varying stages of construction for diverse architectural features including domestic structures, monuments, plazas, stelae, and benches (Ballinger and Stomper 2000; Fash 1988; Freidel and Schele 1989; López Luján 2005b; Monaghan 1998:47; Stross 1998; Vogt 1998). The offering cache became the "heart", ensouled and fed through blood, animal and/or human sacrifice that animated the structure (Broda 1988; López Luján 2005b; Stross 1998) or as a way of maintaining an amiable relationship with the animate structure (Brown and Emery 2008). This may be why, during termination rituals, these caches are ceremoniously "de-hearted" or de-animated (Joyce 1992; Stross 1998:Footnote 5; Sugiyama 1998b). In such cases, one may find evidence for extensive looting activities that took place upon abandonment, as was found in the case of the Feathered Serpent Pyramid excavations (Sugiyama 1998b) or that material objects are found ritually "killed" and broken (Joyce 1992).

Monaghan (1998:50) pays particular attention to dedication ceremonies as an example of production that allows us to conceptualize the rites and practices as partaking in the creation and maintenance of the conditions of their existence without isolating these as a phenomenologically distinct activity. I agree with Monaghan's (1998) use of production in understanding dedication rituals, but add that we should conceptualize them within the process of ritualized production of place, of the significance of the built environment that must be animated by these acts.

The association of ritualized production to strategies of power and control is apparent. Certainly there are levels of esoteric knowledge that must be coded through the ritualized actions by the ritual practitioner and those who oversee its production, while these acts must be decoded by the participants. These participants include individuals that are involved in its production (architects, engineers, ritual specialists, state personnel, etc.), those associated with the ritual acts during the production who may or may not be the same as the producers (sacrificed individuals, performers such as musicians, observers), and the people who participate in the ongoing maintenance of this place through interacting with and embodying the place through its use. It is through these complex ritualized actions that a social distance is created through differentiated access to the esoteric knowledge or to empowered symbols, which allows individuals or groups to express political domination and legitimize the ideology of the dominant group (Hruby 2007; Inomata 2001; McAnany 2008; Smith 2003). The following section utilizes the Moon Pyramid as an example to understand its place on the landscape, and how access to empowered animals was essential in this production process.

Making places: the production of the Moon Pyramid

At the Moon Pyramid we find that after the 4th construction sequence, each major rebuilding phase was accompanied by the deposition of an offering chamber (Chapter 3). These offering chambers were probably the means by which the monument was animated. In this section we concentrate on the dedicatory rituals as part of the ritualized production of place, particularly focusing on one of the actors/animals. I argue that the animals that participated in the ritualized performance were central to the construction of the Moon Pyramid as a place. In this section I give a brief overview of the connection between pyramidal monuments and mountains and begin to examine what the connection between mountains/pyramids and animals are in order to demonstrate why animals would have been key symbols in the construction of the monument as an *altepetl*.

Everything about the built environment, particularly at the ceremonial core, was intentionally designed to link the natural landscape to the encultured landscape. Rulers would position the built environment — palace structures, monuments, altars and temples — in relation to important natural features such as caves, mountains, and water sources (Brady and Ashmore 1999). For example, at Dos Pilas, three of the largest public architectural complexes were strategically built in close proximity to caves, linking their authority to water sources (Brady and Ashmore 1999). At Teotihuacan, it has been argued that the placement of the Moon Pyramid was intentionally aligned to the Cerro Gordo mountain that looms directly over the monument (Kowalski 1999; Tobriner 1972).

The connection between the Cerro Gordo mountain and the Moon Pyramid is not surprising, as pyramids were often conceptualized as artificial mountains throughout Mesoamerica (Bernal-Garcia 1993; Townsend 1982; Vogt 1981; 1983:113-114). Ethnohistorical documents explain that the natives conceptualized pyramids, such as the largest monument in the New World found at Cholula, as "mountains made by hand" (Seler 1986:35). So, why were mountains so important that they had to replicate these features at the core of their city?

Mountains are considered sacred entities and portals between the earth and sky as well as the gateway for the entrance into the underworld in Mesoamerica (Brady and Ashmore 1999; López Austin and López Luján 2009; Townsend 1982; Vogt and Stuart 2005). They are an axis from which celestial forces and primordial waters of the underworld can be accessed (Carrasco 2000:135). These sacred mountains store vital life sources, water is kept, and is why springs and rivers are found at the foot of mountains (Bernal-Garcia 1993; Sahagún 1956, Vol. III:344-345; Tobriner 1972). The Aztecs would often depict a hill with a cavern or bowl full of water (Bernal-Garcia 1993; Sahagún 1956, Vol.III:344-345), suggesting a literal interpretation of the natural phenomenon of the origin of water sources (rain clouds, rivers and spring) residing in the mountain (Broda 1989). A mural paintings at Tepantitla in Teotihuacan depicting a bell shaped hill with water inside or gushing out of it from a cave opening, demonstrates this strong link between water, mountain and cave (Kowalski 1999; Tobriner 1972). As a life giving source, mountains were “alive”, endowed with sprit through the actions of divine kings and ritualized performances (Freidel and Schele 1989; Stuart 1997; Vogt 1981).

This concept of mountains as the life sustaining source was linked to the concept of *altepetl*, meaning “watery hill”, “hill of sustenance”, or “water-mountain” (Sahagún 1956 Vol. III:345). The concept of *altepetl* was synonymous with the concept of a ‘community’ or ‘king’ precisely because it referenced this conceptual link between cave-springs, mountains, and human settlements (Kowalski 1999; Lockhart 1992; McCafferty 2008; Seler 1986:35). As a social integrating unit, it encompassed, “the ruler, his supporting population, and the geographic territory that supported them.” (Hirth 2003:69). *Altepetl* are found depicted in 16th century manuscripts. Rulers drew on the concept of mountain-*altepetl* for their political backing, as they were the locus where they can control vital life sources and draw on their ancestral spirits (Stuart 1997). These mountains were the portals to the underworld from which the mountain gods controlled lightning, thunder, clouds and the rain (Vogt and Stuart 2005). It is at these sacred mountains that patron deities responsible for the creation and protection of the community resided (López Austin and López Luján 2009).

Pyramid mountains have been argued to be central features of the ceremonial landscape throughout Mesoamerica (Broda 1989; Knapp and Ashmore 1999; McCafferty 2008; Townsend 1982). In fact, ethnographically, it has been argued that every community holds a close connection to mountains (Vogt and Stuart 2005). They were the axis from which sacred geography was created, linking mythical/historical models of the cosmos, bounding communities both physically and politically through the ritualized landscape, and they were places where memories of kings were consecrated (Freidel and Schele 1989; McAnany 1998; Townsend 1982). The analogy to pyramids is even more strikingly appropriate, as ethnographic records demonstrate that mountains were conceptualized to be stratified, containing 13 horizontal layers like the heavens that symbolized the sky and the ascent towards the heavens (Vogt and Stuart 2005). Unequivocally, the main stairway leading up to the pinnacle of the pyramid would have replicated the ascent into the heavens, as only restricted actors would have had access to move through this vertical space.

What is of particular interest to the present argument is that mountains were considered not only the location where water was stored, but were also places where other "beings" resided. Animals, ancestral spirits, and deities are said to inhabit sacred mountains (Gossen 1975; Hill 1992; Vogt 1981; Vogt and Stuart 2005). It is in these sacred mountains that animal companions were corralled at night, keeping them safe from harm (Vogt 1981). This ideology was vividly documented during the Fiesta del Volcán among the Cakchiquel Maya, where the Spanish take-over of Cakchiquel land during the Colonial period is re-enacted. Such a festival included the construction of a large volcano replica at the main plaza, where live flora and fauna decorated the structure, and live deer, peccaries (wild pigs), tapirs, coatis, and other creatures were placed in their interior through cave-like openings built on its sides (Hill 1992:1-6).

There is a hierarchy among the animal companions, that were divided into upper and lower levels, the most prominent "master" of the animals being the ferocious jaguar (Gossen 1975). Animals and animal companions played a vital role in keying in on a particular mountain as *the* sacred mountain where a community of animals specifically linked to the community resided (Sugiyama 2013a). These animals provided the link to ancestral sprits and deities. The community within the mountain was as hierarchical as the community outside of it, making this such an appropriate metaphor linking the social landscape to the natural landscape, and "naturalizing" the "social speciation" in the community (McAnany 2008).

Being the prominent mountain in the Teotihuacan Basin with active springs along the foothills, Cerro Gordo (650m high) was probably regarded as Teotihuacan's sacred mountain, as the source of sustenance for the expansionist city (Tobriner 1972). The major north-south avenue, the Avenue of the Dead, is aligned toward the center of the Cerro Gordo mountain and the Moon Pyramid, aggrandizing these two features as the central figures that oriented the sacred geography at this city center. Several natural features of the Cerro Gordo make it a prominent candidate as the sacred mountain. The main advantage is the eminent springs and streams that would have flowed from the mountain itself and the presence of small and large caves at its base (Gamio 1922:13). Noticeably, the Cerro Gordo has a "quebrada", a cleft at the pinnacle, a feature present in many extinct volcanoes, that is where people have argued you can listen to the gushing waters that are to be found within the mountain (Tobriner 1972).

Altars, shrines and marcadores scattered throughout the Cerro Gordo further confirm the importance of this mountain as a central feature in the ceremonial landscape.

The Moon Pyramid, standing as a replica of this grand mountain may have been the artificial counterpart of this *altepetl* situated so centrally to the monument core. However, it is not the largest monument by any means, as the Sun Pyramid is much larger in scale, and there is not sufficient evidence for a rich iconographic repertoire that directly addressed the symbolic values of this monument, as can be found in the FSP (López Austin, et al. 1991). Thus, we must rely on reconstructing the ritualized production of this place, specifically through recreating how the monument grew and the dedicatory rituals to be able to interpret the social identity of the monument as the sacred *altepetl*.

As can be seen by the abundance of highly symbolic artifacts that are carefully laid out in strategic locations, the dedicatory caches found at the Moon Pyramid graphically encoded highly symbolic referents that expressed emblems of sacred rulership, militarism and sacrifice (Sugiyama and López Luján 2007). Indeed, throughout Mesoamerica, foundation caches are said to metonymically replicate the cosmos (Joyce 1992; López Luján 2005b). The objects and sacrificial victims placed in such caches identified the sacred character of the place, orienting the space within a complex web of symbols (Joyce 1992; López Luján 2005b; Velázquez Castro 2000). The main actors that are the subject of the remainder of the dissertation are the animals that partook in these dedicatory acts. What role did these animals play in the ritualized spectacle? Did they play a role in the definition of the ritualized landscape, particularly in the construction of the Moon Pyramid as *the altepetl*? Were they converted to key symbols that “naturalized” the highly differentiated social environment of Teotihuacan? In other words, how were animals and animal mediums experienced in the ritual spectacle? In order to address this issue, we must first attempt to define what an animal is.

The Animal: Definitions and Interpretive Paradigm

Any interpretation about animals in past societies must begin with a discussion about what constitutes an animal and defining the relationship between humans and animals. While it is difficult to assume that we would be able to completely recreate such conceptions in past societies, recent anthropological literature on human-animal relationships provide an effective starting point to base our understanding of animals in Amerindian societies for the present study.

Perspectivisim: Animals as ontological agents

Increasing anthropological interest has been devoted to understanding animals as conscious, intentional agents, ontological subjects that required meaningful relationships to be built (Armstrong Oma 2010; Bird-David 1999; Hallowell 2002; Ingold 1988a; Viveiros de Castro 2012). In Hallowell's (2002) exemplary study of Ojibwa Indian ontology, he demonstrated that humans and "other-than-human persons" have the possibility of having the same ontological status as humans through establishing interpersonal relationships. They have, "the capacity to occupy a point of view", and this viewpoint is referred to by some as "perspectivity" or "perspectivism" (Viveiros de Castro 2012:54). Ojibwa conceptualized animals, plants and other natural features/objects as 'persons' that have agency and consciously interact with other 'persons'. Such an interpretation is abundant throughout the New World, and has been characterized in Amerindian cultures throughout South, Central and North America (Ingold 1988b; Schaefer and Furst 1996; Ulloa 2002; Urton 1985; Viveiros de Castro 2012; Zingg 2004) and can even be argued for various Old World cases (e.g. Anderson 2000; Kimura 1999).

While such conceptualization of the "personhood" of any object/subject is helpful in avoiding the pitfalls of a modernist perspective, Bird-David (1999) urges us to explain how the beliefs are engendered and perpetuated through what he calls "superpersons" (persons with extra powers). Looking at the Melanesian Devam ritual, Bird-David (1999) demonstrates that animism must be understood as a relational epistemology, whereby performances raise people's awareness of 'persons' and act as a way for understanding one's place in this interlinked relational environment. Thus conceptualizations of animals are not simply imposed, but discovered and modified, through observation and interaction— through human-animal 'eco-contracts'— where there are mutual rights and obligations designated during this transaction (Armstrong Oma 2010; Betts, et al. 2012; Bird-David 1999). In fact, Viveiros de Castro would go to the extreme in saying that, "The original common condition of both humans and animals is not animality, but rather humanity." (2012:56). In this view, animals are always subjects with an encultured perspective, and must always be conceptualized as such when discussing their roles within a society in the same way individual humans are interpreted.

Others have characterized this “humanization” process as a way of creating a “sentient ecology” built by knowledge of and by the reflexive actions between human persons and animal persons (Anderson 2000:129-130). In a sentient world, a human moving through the encultured landscape is necessarily interwoven within a web of conscious interpersonal relationships, and cannot be isolated from such an entangled landscape (Saunders 1991). Furthermore, human and animal categories are “produced” by a culture-specific system actively negotiated through establishing relationships with animals, which must be maintained (Ulloa 2002). Daily practices, hunting and subsistence strategies, and ritualized performances produce, maintain, reinforce and modify such relationships. This perspective of understanding animals as “persons” transforms the empirical natural environment into an entangled landscape, becoming the setting for developing meaningful relationships with their surroundings. Brown and Emery (2008), for example, have demonstrated that hunting shrines in a modern Maya village in Guatemala mitigated the active maintenance of a relationship with various agents on the landscape — the animal guardian, special rock outcrops, rock shelters and caves, the hunted animal itself, hunting dogs, weapons, and the skeletal remains of the prey. Through ritualized actions at hunting shrines and the maintenance of these relationships even in daily consumption activities, hunters were able to safely cross the domestic/wild boundary into the dangerous forest during hunting practices.

When conceived as ontological agents, our understanding of the role of animals in ritualized spectacles is radically reshaped. We can understand ritualized performances as a central stage for the establishment of meaningful relationships with these animals, and also the setting where individual animals are transformed into empowered symbols. The ritualized performance would not have treated animals as objects, as reified entities, but as active subjects with their own metaphysical standing throughout the trajectory of the ritualized process (Patton 2006:393). Such an emphasis on relational ontology brings to the forefront the interactions with the animals, how people physically and symbolically interacted with the animals on the landscape.

As hunters particularly are sensitive to maintaining a strong bond with their prey, they provide an effective case to study some of the material correlates that manifest this intimate connection, often through possessing particular animal products such as hides, bones, and teeth (Hill 2011; McNiven 2010). Hunters navigate the human-animal divide, or lack thereof, through establishing interpersonal dialogues with their prey that are usually characterized by mutual sentience, mythical linkages in the form of kinship, and shared personhood (McNiven 2010). Looking at the progression of these interactions, one can examine the changes in the social and economic engagements in ritualized contexts. For example, Betts and colleagues (2012) were able to interpret the type of human-shark interactions through chronological changes in the abundance and spatial distribution of specific species of shark teeth.

Such case studies demonstrate that highly intimate relationships between humans and animals can be recorded through the material correlates of physical faunal products and bodies. It is through understanding the relationships that were established, both physical and symbolic, that we can begin to interpret the role of animals in the concretion of dominant ideologies at Teotihuacan.

Animal classificatory systems: "Naturalizing" the social landscape

One way to investigate the nature of the relationship between humans and animals is by examining animal classificatory systems. Ethnozoological classificatory systems highlight the relationship between animals, as well as their connection with humans. They explicitly address attitudes, motivations and inter-reliance between and among humans and animals (Leach 1964; Tambiah 1969). They prove to be indexical categories, referencing unique ways of perceiving and interacting with the world, and serve as cosmological directories (Urton 1985; Viveiros de Castro 1998).

Animal classification systems are particularly relevant in orienting forms of human social organization. As encultured subjects, animals abide by, reinforce, or modify the rules and regulations prevalent in the society (Hill 2013).They help us categorize humans in the same way animals are classified, and are simply an extension of how human social relationships are organized (Douglas 1957; Lévi-Strauss 1966). As with the human world, not all animals are made equal, and it is precisely the diversity in the morphology, behavior and ecology of the animal taxa that provide the bases for native zoological systems (Zuidema 1985).

The Tzotzil Maya, for example, explain that companion animals of a community occupy the sacred mountain (Gossen 1975). This mountain has 13 horizontal levels like the heavens, with each stratum containing specific companion animals. The difference between predator/prey and domestic/wild are particularly relevant in the animals' position. Only wild animals with five digits can be an animal companion (Gossen 1975). There is a hierarchical arrangement of animals where wild carnivores stand at the upper strata of the animal hierarchy while herbivores and small animals inhabit the lower levels (Gossen 1975; Pinzón Castaño 2002; Vogt 1981). Such an emphasis on predator-prey relationships helps legitimize social difference due to the apparent dominant role of the predator. At the same time that they function as food-givers, they also secure the harmonious exchange of gifts between society and the gods utilizing elites as intermediaries (Busatta 2007). As the hunter *par excellence*, carnivores are often thought to have been the ones who taught humans how to hunt and are responsible for the success of their subsistence strategy. For example, the Huichol Indians perceive the wolf as their elder brother who taught man how to hunt deer (Valadez 1996). As such, predators are often viewed as controlling the natural landscape, and as "masters" of the animals; they are key symbols of dominance, power and authority. Only the most powerful *principales* (elites) can claim to reside in the highest levels of social hierarchy who have the "master" of animals, the giant jaguar, as their companion (Vogt and Stuart 2005).

The concept of a master of animals, or guardian of animals, seems to be pan-continental (Gossen 1994; Hill 2011; Ingold 1986; Viveiros de Castro 2012:55), where certain species are attributed as dominant and able to control other animals. Such dominant animals were also highly praised as intermediaries with other spirits, gods and ancestors. Of course, not everyone can have a jaguar as their soul companion, and as individuals discover their animal companion, usually through dreams, it demonstrates that the individual's fate and fortune are somewhat predetermined (Busatta 2007; Gossen 1994:566; McAnany 2008). This explains why hunters, warriors, shamans and royalty have always maintained a close association with the jaguar, as the ethno-zoological classification system acknowledged social hierarchies (Saunders 1991).

At this point I have repeatedly emphasized that interpersonal relationships that humans establish with animals are essential in defining where they stand in the social classificatory system. Several types of relationships can exist between humans and animals including wild, domesticated, tamed, or herded animals. While these boundaries may very well overlap in some cases, domestic animals are characterized by morphological (biological) changes as well as alternation in the social interaction that is based on interdependence. Animal taming involves a type of social incorporation of the animal into the household while herding practices are merely the keeping of animals as property (Russell 2012b). Management merely refers to any deliberate practice to maintain or alter the demographics of an animal population including selective hunting, restricted usage, or habitat manipulation. Only domestication assumes that breeding took place within the domestic sphere (and radically changed the phenotypes of animals to create a symbiotic relationship), and domestication can be carried out to various extents.

In the case of domestication, this process reinforces the humanity of the animal and creates a new perspective on the animal hierarchy, establishing a relationship based on subordination and control. This is why some go so far to argue that the presence of a dominant hierarchy may be a prerequisite for domestication (e.g. Clutton-Brock 1994). Ingold (1986) further draws a parallel between the dominant position that the domestication process places humans in and the position animal guardians exhibit over the domain of wild animals. Others have argued that when a ruler, shaman or warrior “domesticates” or establishes a direct connection with or understanding of the animal, they are given magical properties, often of the attributes of the animal in question (better sight, hunter instincts, strength) (Pinzón Castaño 2002). In the present case, then, we must ask what was the nature of interactions with animals and how did this contribute to the definition of the natural, and thus the cultural, landscape of Teotihuacan?

Ritual and Animal Bodies: Agents in a Ritualized Performance

In this section, I highlight the two types of zooarchaeological data examined in the thesis: animals sacrificed in dedication to the monument (complete, primary burials); and animal mediums expressed by their body parts which were deposited as offertory artifacts (secondary burials). Both of these datasets highlight the importance of the physicality of the body as a medium for the ritualized experience. As Bell (1992:93-99) explains, it is the body within the symbolically structured environment, as it moves across a ritually defined space and time, that forms the “ritualized body”. Such a body is invested with a ‘sense’ of ritual, internalizing and defining the principles of the delineated environment (Bell 1992). This body is the basic level that constitutes the site where the micro-network of power relations is tactfully negotiated, maintained and managed (Bell 1992:197-204; Foucault 1980:55). It is through the movement of the ritualized body that the social landscape is mapped out, produced, and transformed (Carrasco 1991a). As the fundamental expressive instrument, ritualized spectacles provide an opportunity for maximum social objectification of bodies and body parts as they are produced through the ritualized process (Viveiros de Castro 1998:480)

Highlighting the role of the participants in a ritual, Rappaport (1979; 1992) argues that the act of being in a ritual indexically signifies the acceptance of the symbolic attributes expressed in the ritual. In this view, performers do what rituals do best; they communicate and embody through participating in the ordering of the social landscape and the symbolism that they themselves did not necessarily encode. The performative approach taken here highlights this aspect of the autonomy among participants, where individuals may have varying levels of internalization of the motivations of the practitioners (Bell 1997; 2005; Inomata and Coben 2006:15). But it is their bodily presence in the constructed social space that embeds the participants into the entangled social landscape. It is not that every participant body (human and non-human) believes in the meanings and associations attributed to them, but that their presence within the ritual makes the body embody what it represents through the ritualized process, activating the participant as a “person”, a social agent in this entangled landscape. So, as I discuss the animals at Teotihuacan as active “persons” that were empowered as state symbols through the ritualized spectacle, it is their physical appearances and the interpersonal relationships manifested during the act that accredits a source of agency of the animal to the process of constructing meanings and motivations behind the act.

In the present case, I distinguish between two ways that animals participated in the ritualized act. One is as live animate entities that would have entered the ritual spectacle as active agents where the Teotihuacan state would have interacted with the live beast. In such cases, they became victims of sacrifice and were placed within the chamber as key participants that oriented and animated that space. The second scenario is that animal body parts — heads, wings, claws, isolated elements — entered the ritual spectacle as objects that embodied the animals from which these products were extracted. The majority of the cases were cranial elements and sometimes claws that mnemonically would have referenced the animal in question (*pars pro toto*). In such cases I interpret the role of these ritualized artifacts as part of the same performative actions and compare how the same species of animals entered the ritual scene through two very distinct processes.

Animal Sacrifice

Animal sacrifices have been illustrated to be a very powerful form of ritualized act throughout the world (Hill 2000; Kimura 1999; McKusick 2001; Russell 2012a; Yuan and Flad 2005a). Here I define the context and perspective from which sacrifices are interpreted and how the present zooarchaeological dataset is used to reconstruct the ritualization process. This is how an animal is selected for and participates in this potent act as a sacrificial victim for the state. But first, we must start with understanding what sacrifices are and how they can be distinguished from other forms of deposition in the archaeological context.

There is an active anthropological discourse on definitions of sacrifice, particularly concerning the origins and nature of the act (Carrasco 2005; Hamerton-Kelly 1987; Henninger 2005; Hubert and Mauss 1964; Russell 2012a). In this study I concentrate on one aspect of sacrifice from a very particular dataset. I take the broad definition put forth by Henninger, who explains it as originating from the Latin word, *sacrificium*, *sacer* meaning 'holy' and *facere* referring to the act 'to make', suggesting that the consecration of the object/subject was the defining feature of sacrifice (2005:7997). He further examines the definition put forth by the Encyclopedia Britannica as, "a cultic act through which objects were set apart or consecrated and offered to a god or some other supernatural power" (1977, vol 16:128b, cited in

Henninger 2005:7997). Such a definition allows me to concentrate on sacrifice as a means by which the victims, in this case animals, were "set apart", consecrated to participate in state-level ritualized performances. Such a perspective highlights all the aspects of the ritualized performative act discussed above, analyzing the process by which they were "set apart", chosen for the "selective kill" (Smith 1987a).

Some have argued that animal sacrifices must necessarily be of a "domesticated" animal because only something that is under the human domain can be sacrificed (Firth 1963; Ingold 1986; Smith 1987a). This is particularly true if sacrifice is interpreted as a gift, debt payment, or as a form of substitution, suggesting that humans must own it before it is given up (Carrasco 2008; Firth 1963; Henninger 2005; Hubert and Mauss 1964). Appropriately linked to forms of power and domination, such sacrifices are associated with, sometimes even regarded as exclusive to, complex, hierarchical systems (Smith 1987a).

Certainly the majority of zooarchaeological evidence does demonstrate animal sacrifices were composed of domesticated animals (Clutton-Brock 1989; Russell 2012b). Although Smith doesn't necessarily argue for the prevalence of only domesticated animals in any strict form, his inclusion of animals brought into the domestic sphere through captivity — such as in the Ainu bear ceremonies — are examples of domestication immediately prior to the sacrificial slaughter (Smith 1987a). Indeed cases of capture of wild animals to be utilized in sacrificial rituals are recorded elsewhere (Blanco, et al. 2009; McKusick 2001; Pohl 1991) and were probably one of the major forms in which animal sacrifice was performed. However, there are plenty of cases documenting varying quantities of non-domestic animals being sacrificed (Ballinger and Stomper 2000; Emery 2013; Fiskesjö 2001; López Luján 2005a).

While I do not agree with an exclusionary perspective of animal sacrifice to encompass only domestic animals, I do find Smith's (1987) argument for the selective kill to be important in the present discussion. The idea of the selective kill, in contrast to the fortuitous kill, brings to the forefront the selection process whereby the humans must establish an interpersonal relationship with a particular animal, individualizing the participant as the chosen victim. By realizing the personhood of the animal, the ritual practitioner establishes a relationship that may be dominant to – as argued by Smith through the process of domestication – equivalent to, or subordinate to the victim in question. I argue that we should trace the nature and process of how human-animal interpersonal relationships were formed in the past to understand why these animals, as individuals, were transformed into victims of sacrifice, without assuming this connection *a priori*. Such an investigation necessitates, as Smith (1987) has argued, a "thick description" of exemplary ritual processes and ensembles. Zooarchaeological studies are particularly effective in defining what sort of interpersonal relationships were formed, one of which may be the process of domestication. In the following section I utilize examples of human sacrifice as a model for understanding animal sacrifice, because there are rich ethnohistorical data that allow us to understand this consecration process in detail.

So, how were animals 'set apart'? How did they undergo a selection process? Patton (2006) argues that the selection process begins from the very beginning where the victim was perfected or beautified, as only the flawless victim is apt to reach a state of deathlessness, becoming "like the gods" and making them the appropriate eschatological victims of sacrifice. Carrasco (1991a) has described this process during the selection process of the sacrificial victim in the Toxcatl festival. A male warrior captive is selected as the perfect archetype to become "*teteo imixiptlahuan*" a deity impersonator, in this case of the god Tezcatlipoca. Very detailed criteria for the god's "human form" are laid out in the Florentine codex stating that the victim, "… who had no flaw, who had no [bodily] defects, who had no blemish, who had no mark,…" was selected (Sahagún 1979:68).

Once this victim is chosen, there is a transformation in the social identity of the individual that is defined by the interpersonal relationships that are formed. In the case of the Toxcatl festival, the deity impersonator lives as the god Tezcatlipoca within the city. As he is transformed into a godly archetype through physical training in Aztec arts, enjoying the greatest of luxuries, he embodies this new identity as he is paraded throughout the empire, transforming the landscape into ritualized places (Carrasco 1991a). The movement of the deity impersonator from center to periphery and back again to the ceremonial core was essential to bridging this boundary between center and periphery, serving as a wobbling pivot, that ritualized the entire landscape (Carrasco 1991b). It is through the daily interpersonal interactions between the deity-impersonator and the rest of Aztec society that the victim becomes Tezcaltipoca, empowered by the ability to transform the landscape. During this process, the image of Tezcatlipoca became "alive" through the victim's bodily manifestation.

During the sacrificial act, there is a so-called "fiction of willingness" by the sacrificial victim (Patton 2006). The victim must necessarily never be divested of its agency/free-will, and at least in theory must accept this role. Being identified as a deity impersonator had its advantages, not only during the time spent literally living like a god, but also in that it caused the individual to become immortal and brought benefits to his family. Documents record that deity impersonators would voluntarily walk up the steps of the main temple of the city center of Chalco. There his heart was extracted, he was beheaded, and his skull was placed on the *tzompantli* or skull rack (Carrasco 1991a; Sahagún 1981). While other sources suggest that the victim's willingness varied greatly (Carrasco 1991a), social pressures into embodying this role as a deity are apparent. Patton (2006) gives examples in which theoretical animal consent is simulated through sprinkling water upon the heads of ancient Greek *thusia* and ancient Iraelite *qorban 'olah* rituals, making the animals appear to nod in assent. Similarly, if hunting rituals can be categorized as a form of sacrifice, they are usually understood as forms of acceptance, either by the prey specie itself or by the master of animals that controls these animals, who permits the prey to be hunted and killed (Brown and Emery 2008; Hill 2011).

The embodiment of the deity impersonator as a god makes us consider the social implications of the victim's body. The consecration and embodiment process of the victim results in the death of, not the sacrificial human victim, but the sacrifice of god himself (López Austin 1988:376-377). The care in which the sacrificial victim's corpus embodying the deity is treated, carefully brought down from the temple instead of rolled down the temple steps, and the veneration of the skull in the ceremonial center as part of the skull rack, all demonstrate an emphasis on the bodily traces of the sacrificial act.

Reviewing the analysis of the Toxcatl festival by Carrasco (1991), we can interpret the transformation of a warrior captive into a deity impersonator as the process by which the victim was set apart, undergoing a hierophany in order to become the ultimate sacrificial victim, the deity Tezcatlipoca himself. Similarly, animal sacrifice is the process by which an anonymous animal, or group of animals, are singled out resulting in supreme efficacy for giving them agency, purpose, identity and metaphysical standing (Patton 2006:397). The animal becomes a ‘person’, gaining perspective and social agency.

Now, how can this process be recorded archaeologically? I argue that because the consecration process is marked by the establishment of interpersonal interactions, physical manifestations of these interactions etched into the bodily material remains are effective places to look. Faunal remains can record how animal taxa or categories were valorized. Looking at age, sex, and other visual cues may illustrate what the major motivations were behind the selection process, and allow us to record changes or origins in the sacrificial practices and their motivations (Russell 2012b). Many of the materials from the dedicatory caches at Teotihuacan are unique in the rich contextual data that allows us to reconstruct complete life histories of the individuals. Such reconstructions include traces of physical human-animal interactions throughout the ritualization process. These investigations, as discussed in Chapter 5, demonstrate a complex picture of a heterogeneous population that included animals probably kept in captivity for extensive periods of time. How such evidence for captivity and confinement should be interpreted within the ritual spectacle necessarily must take into consideration this process of setting these animals apart from natural landscape into the encultured landscape of Teotihuacan.

Animal Products

It is impossible to isolate an animal product from the conceptualization of the animal, as the element embodies the whole. Animals and animal guardians were highly aware of their bodies, and sensed where and how the body parts were treated and distributed (Hill 2011). The Highland Maya explain during hunting rituals that after the successful hunt, all elements of the prey must be returned to the hunting shrine, taking special care not to leave butchery marks on the skeletal remains (Brown and Emery 2008). This is because, as an interview by Brown and Emery at the Maya village of San Pablo la Laguna documents, the animal guardian “makes a new animal from each bone you return- even the smallest toe bone. That is why you have to return them all” (Brown and Emery 313). This demonstrates that the procurement, use and deposition of particular animals were operating within the prescribed social rules and regulations within particular spatial and temporal constraints.

As animal body parts represent the whole, animal products such as bone, teeth, pelts, feathers, or even representations of the animal were ‘persons’ that were complex entities capable of bestowing entangled meanings and perspectives (Viveiros de Castro 1998). They became mnemonic devices and instruments composed of, “ways of perceiving and acting in the world” (Conneller 2004:44). Furthermore, animal body parts were considered as mediators for communication or transformation into spirit animals (Knab 2004). For example, Conneller (2004) has recorded how the manipulation and wearing of the red deer antlers stimulated the wearer to experience the body and perspective of a red deer. Such transformations enable the success of a hunt (McNiven 2010). For example, possession of shark teeth enabled access to certain supernatural abilities of that potent predator (Betts, et al. 2012). Just like the hunter, the jaguar or eagle warriors, the bravest warriors in the Aztec empire, dressed in elaborate animal costumes and were said to possess the cunning skills of those very predators on the battlefield.

Animal bodies also protected and animated important buildings, marking them as places on the landscape. Looking at the species variability among Neolithic midden and burial deposits, Jones (1998) argues that the deposition of specific symbolic animal remains, particularly large bodied carnivores, were central to the production and definition of the place. This process “involved the appropriation of certain powerful and special animals which were part of the lived and encultured landscape, and indicates the highly specific identities constructed between people, the landscape and animals, which in some cases involved redefining the ontological and spatial relationships associated with the bones of the dead through the medium of the topography of the landscape” (Jones 1998:319). In many cases, animal bodies are literally embedded within the places, as seen by the whale and cattle remains found in between junctures within the wall, passage and roofs at Skara Brae and Pierowall Quarry (Jones 1998:37). Meskell (2008) found similar assemblage of animal skulls being fixed into walls and features at Çatalhöyük. Thus this dissertation questioned what body parts of which species were utilized in the ritual spectacle and how these faunal artifacts contributed to the ritualized performances.

Ritualized Animals

This chapter sets the stage for the ritual spectacle in the ceremonial core of Teotihuacan. It defines the main theoretical constructs undertaken in the present study, which illustrates how abstract meanings and perspectives of rituals can be recovered through material correlates in the zooarchaeological dataset. Rituals are understood as a performative act, whereby participants engage in meaningful actions. Such a paradigm highlights the significance of the performative act, accessible through identification of key symbols that are constructed through the actions of the participants within the organized space. This paradigm brings to the forefront the production of the theatrical event, along with its stage, not as a epiphenomenal social process, but as the driving force that creates, concretizes and transforms social relations (Inomata and Coben 2006:33). Such spaces are produced by — and for — the ritual spectacle, whereby they become places embedded in the asymmetrical cultural landscape. All such meaning building, through the interaction of symbols in places, is mitigated by the participants who become the main actors that produce, reify, and transform the social landscape. In the remainder of the dissertation I investigate the role of animals in such state spectacles; as key symbols, as empowered subjects, as eschatological victims of sacrifice, as animal products that embodied such identities, that all contributed to the success of the theatrical event. The zooarchaeological dataset was key in reconstructing the ritualized process that such animal and animal mediums underwent, situated within the rich archaeological contextual dataset, that allows us to evaluate how humans interacted with and perceived animals at the ancient metropolis.

Detailed reconstructions of how animal identities were constructed required a close revision of how each species was conceptualized in Mesoamerica, utilizing ethnographic, ethnohistoric, iconographic and biological data. The particular zooarchaeological remains of the sacrificial victims was analyzed to reconstruct individual life histories of the animals sacrificed in the ritual spectacle at Teotihuacan to understand how these animals came to be active participants (Chapter 5). Similarly, a detailed reconstruction of the ritualized production of animal bodies examined how some artifacts became entangled objects within the complex web of offertory remains in dedication caches (Chapter 6). Given the diachronic and synchronic nature of the zooarchaeological assemblage, including faunal remains from two monuments, the Moon Pyramid and Sun Pyramid, and from different construction stages, spatial and temporal differences among the two monuments across time are considered. Such a dataset provides potential for identifying changes over time and space regarding how the relations among the participants, particularly between animals and humans, changed through the shifting dynamic sociocultural landscape at Teotihuacan.

CHAPTER 3

Excavation Contexts: Situating the Ritual

At the civic ceremonial center of Teotihuacan, three major monuments prevail the cultural landscape as major icons of state militarism and domination. This ceremonial core, with its paramount monuments, is the central setting of this dissertation and its chronological, spatial and cultural context from which the faunal assemblage was discovered must be described. A coherent state religious ideology, successful warfare, and charismatic rulership, all aspects that were integral to the development of an effective and expanding state, were expressed at the ritual precinct through the construction of the ceremonial landscape. During its production large-scale dedicatory offerings were embedded inside the monuments. This chapter situates these pyramids within the dynamic socio-political landscape of Teotihuacan, beginning with a brief background of the city itself, concentrating on the major monuments that are the subject of this dissertation. By contextualizing these monuments into Teotihuacan's socio-political history, a direct association between the production of the monument and state-empowerment can be traced. Thus, I argue that the meaning behind these monuments, particularly for key symbols like the fauna discussed in this dissertation, was reified during the ritualized production of these highly empowered places.

The Natural Environment

The Basin of Mexico, where the Teotihuacan Valley is located, is characterized as a temperate semi-arid environment in the highland plateau at an elevation of 2,300 meters. It is one of many closed basins within the Volcanic Cordillera, formed by the multitude of volcanic activates that transverse between the Bajio region to the north and the Rio Balsas basin to the south (Leopold 1972). The Teotihuacan Valley is thus surrounded by mountains and volcanoes, many of which are placed in direct association to some of the major monuments at Teotihuacan (Gamio 1922).

As with the rest of Mexico, the wet and dry season are key in understanding the agricultural cycle at Teotihuacan with cold and dry winters, and warm and wet summers that bring about more than 80% of the annual precipitation (Sanders, et al. 1979:82). Rainfall ranges within the Basin of Mexico, from the wetter southwestern mountains receiving more than 1500 mm to the more arid northeastern plains recording just 450 mm. The Teotihuacan Valley is one of the drier areas averaging only ca. 500 mm annual precipitation (Sanders, et al. 1979:82; Starbuck 1975:17). Such changes in the wet and dry seasons, that was marked by divisions in the Mesoamerican calendric cycle of 260 and 105 day separation is said to have been expressed in the monumental center of Teotihuacan, particularly in the dimensions of the Sun Pyramid and the Moon Pyramid, Building 4 (Sugiyama 2013b).

Mexico, designated as one of the megadiverse countries of the world, contains a biome enormously rich in faunal and floral diversity because two major biogeographical zones transition just south of the Mexican Basin: the Nearctic real to the north where Teotihuacan is located, and the Neotropical zones to the south (Ramamoorthy, et al. 1993). The diversity present in the Basin of Mexico during the Teotihuacan occupation, with approximately 540 species of vertebrates, was supported by the varied geographical landscape that included tundra, desert and lake systems that was amplified by access to a drastically distinct Neotropical zone immediately to the south of this region (Valadez Azúa 1992:101). Gamio (1922:24-49) was one of the first to come up with a comprehensive list of some of the floral and faunal diversity found in the Teotihuacan Valley, and has been important resource to reconstruct the environmental conditions during the early 20th century prior to the massive population expansion observed today.

Certainly this megadiverse landscape was extensively incorporated into their subsistence strategy, feeding on locally available wild plants and animals to supplement the agricultural products and domestic animals that included the dog and turkey (Starbuck 1975; Valadez Azúa 1992). It is important to note that despite the lack of large domestic livestock, more studies are alluding to the importance of small household-level breeding and taming practices that supplemented wild resources throughout Mesoamerica (McClung de Tapia and Sugiyama 2012). This was probably also practiced in the urban settlements at Teotihuacan (Sugiyama, et al. 2014; Valadez Azúa 2003). Some of the major faunal resources utilized in this ancient city included white-tailed deer (*Odocoileus virginianus*), rabbit and the hare (Lagamorpha), dog (*Canis lupus domesticus*), turkey (*Meleagris gallopavo*) and various species of birds, particularly waterfowl such as ducks (Sanders, et al. 1979; Starbuck 1975; 1987; Valadez Azúa 1992).

Within the Basin of Mexico, a series of five lake systems would have supplemented the natural resources available in the semi-arid highlands. This extensive lake systems in this Mexican Plateau hosts thousands of migratory waterfowl (Howell and Webb 1995:14). Ample ethnohistoric evidence during the time of Spanish conquest documents the reliance on both fresh water and saline resources such as fish, water fowl, migratory birds, crustaceans and mollusks, turtles and even various aquatic insects and their larvae (McClung de Tapia and Sugiyama 2012; Parsons 2006; Sanders, et al. 1979). Similarly the lake system brought about a diversification of aquatic and lakeshore plant resources such as reeds and algae, all of which the Teotihuacan populace would have been able to access. Further details on the zooarchaeological assemblage recorded at Teotihuacan is discussed in the following chapter. However, here I note that such local resources were supplemented by importation of exotic fauna (Rodríguez Galicia 2006; 2010), particularly in the case for ritual usage, including state-level rituals.

The Socio-Cultural Landscape

Teotihuacan is a world heritage site that sprung in the semi-arid uplands of Central Mexico from the fist century B.C. to A.D. 550/650 (Figure 3.1). This site quickly developed into an urban metropolis, extending 20 km^2 with population estimates between 100,000 to 200,000 inhabitants that resided in well-defined apartment complexes (Cowgill 2004; 2008; Millon 1981). It has been argued that Teotihuacan's dramatic growth was marked during the Patlachique (150-1 B.C.) phase and by the Tzacualli phase (ca. A.D. 1-150) had developed into a large metropolitan state (Millon 1992). Based on new radiocarbon dates obtained from the interior of the monuments (see discussion below), this dissertation focused on a period when the state imperial monumental construction program was at its height. From around A.D. 150-350 the Moon Pyramid, the Sun Pyramid and the Feathered Serpent Pyramid all reached a monumental scale, and it is during this massive state-sponsored public-work program that large dedicatory rituals took place. By this point, Teotihuacan's particular orientation would have been established (15°30' east of

Figure 3.1 Map of the Basin of Mexico with location of Teotihuacan highlighted in bold (Modified from Clayton 2011:Figure 1). Note: Site are not contemporaneous to Teotihuacan occupation.

astronomical north) and the city itself was expanding exponentially, all the while Teotihuacan state's presence at a regional level was reaching maximum extent.

For over a century this site has been the center of intensive and extensive investigation at both the ceremonial core and in residential complexes (e.g. Acosta 1964; Batres 1906; Bernal 1963; Cabrera Castro, et al. 1991a; Gamio 1922; López Lujan, et al. 2006; Manzanilla Naim 1993; Millon, et al. 1973; Sanders 1965; Sanders, et al. 1979; Séjourné 1966). Such research has led us to understand the site as a multi-ethnic metropolis with a highly stratified state that expanded its influence throughout Mesoamerica reaching as far southeast as Copan and extends northwest into Northwestern Mexico (Bove and Madrano Busto 2003; Fash and Fash 2000; Michelet and Pereira 2009; Stuart 2000).

Early explorations mainly focused on the reconstruction, consolidation and material cultural studies to understand the primary core of this metropolis (Acosta 1964; Batres 1906; Gamio 1922). Major advancements in our understanding of the Teotihuacan settlement patterns occurred in the 1970s through two major survey projects; the Teotihuacan Mapping Project directed by René Millon that intensively surveyed the Teotihuacan Valley (Millon 1973; Millon, et al. 1973) and The Basin of Mexico Settlement Survey Project directed by William Sanders that placed Teotihuacan within a regional context (Sanders, et al. 1979). These surveys helped formulate a more accurate political history of the settlement patterns before, during, and after the rapid population expansion (Cowgill 1992; Sanders, et al. 1979).

Studies focusing on paleodemography, craft production, settlement patterns, trade, economy, and mortuary analysis have demonstrated that Teotihuacan was composed of a heterogeneous population in ethnic and socio-economic terms (Cabrera Cortés 2011; Clayton 2005; Paddock 1983; Robertson 2001; Spence and Gamboa Cabezas 1999; Storey 1992; White, et al. 2004b). Surface surveys and specific excavations in residential units have identified hundreds of craft workshops, including obsidian, ceramics, shell, figurine, and other production sites that operated within the city with high degree of specialization (Cabrera Cortés 2011; Carballo 2007; Sullivan 2006).

Social identities were expressed at the apartment compound, distinguished by specialized production, burial practices, and household-level ritualized activities (Clayton 2009). Such compounds were specialized and stratified, that was as dynamic as the socio-political landscape at the time, expanding and contracting as the city grew. Studies centered on household-level ritual have proven such activities were the means by which households were integrated into larger social units or as the means to define social boundaries that highlighted the religious heterogeneity of the populace (Clayton 2009). This dissertation, however, focuses on only one domain of religious cohesion, that of state level-ritualized activities at the ceremonial core.

The Ceremonial Core

What distinguishes Teotihuacan from other nearby sites is the apparent scale at which monumentality and centralized urban planning was carried out that is visible and can be experienced at the ceremonial core to this day. Certainly, these factors have converted this site into one of the world's most visited tourist destinations. It still serves as a pilgrimage center, particularly during the spring equinox when millions literary flock into the site. These structures are living monuments, shape shifting within the socio-political landscape of the time (Fash 2013). Covering an area around 150-250ha (Cowgill 2004:533), the ceremonial precinct is where the impetus of the arising state was most vividly expressed through these monumental works. The specific orientation, size, even how the monument was constructed contributed to effectively materializing their cosmogram, embedding the ceremonial landscape within a dynamically shifting cultural landscape (Fash 2013; Fash, et al. 2009; Sugiyama 2010; 2013).

The ceremonial center's orientation is defined by a major north-south avenue, called the Avenue of the Dead, that functioned as the main access route through the center of the precinct. This avenue is flanked by three pyramids: the Moon Pyramid, the Sun Pyramid, and the Feathered Serpent Pyramid (FSP) and a series of palace and elite residential structures (Figure 3.2). Located at the southern extreme of the ceremonial core, a large wall delimitates the citadel in which the FSP stands in two parts: the main corpus of the monument with the original frontal façade with undulating Feathered Serpent imagery, and the adosada platform that later covered this anterior sculptural complex. In the northern sector of the ceremonial precinct, on the eastern side of the main Avenue of the Dead, the Sun Pyramid was constructed facing west that became the largest structure in the Valley. The Moon Pyramid was aligned along the northern limit of the avenue in front of the Cerro Gordo Mountain, providing one of the most grandeur features as one walks north along the central avenue northward from the main entrance.

The archaeological park was created through various large-scale excavation and reconstruction projects over the course of the last century, beginning with the exploration of the Sun Pyramid by Leopordo Batres (1906) in preparation of the 1910 centennial event of the Mexican Independence (Fash 2013). Since this pioneer brought heightened political interests to the site, ongoing excavations have

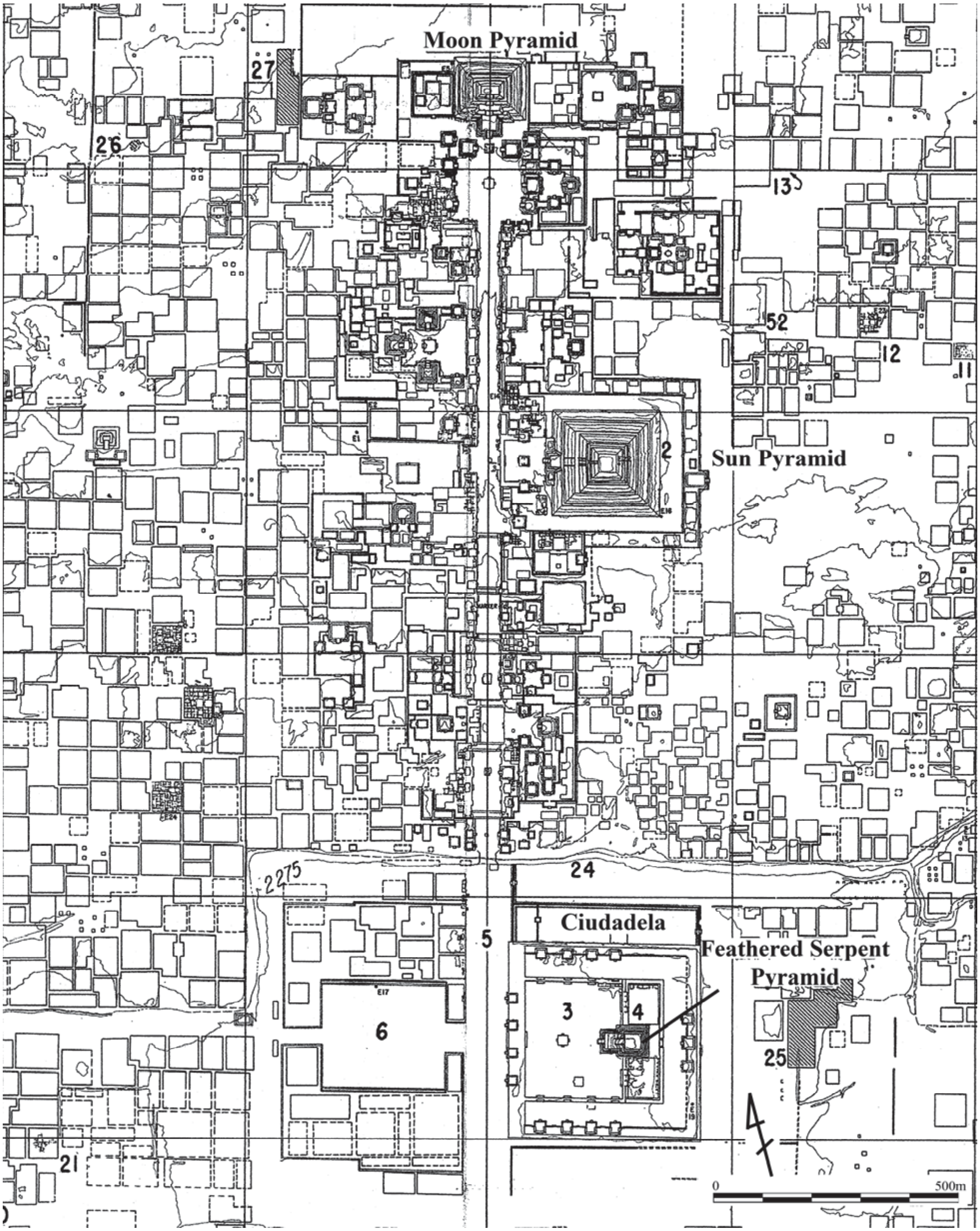

Figure 3.2 Map of the ceremonial center of Teotihuacan with the Sun Pyramid, Moon Pyramid and Feathered Serpent Pyramid labeled. Cropped and modified from Million et al. 1973.

continuously uncovered, consolidated, and extracted artifacts at the ceremonial core that is the basis of our present understanding of Teotihuacan.

The first scientific inter-disciplinary approach, carried out by Manuel Gamio (1922) investigated the socio-cultural and environmental conditions of the Teotihuacan Valley which included excavations at two of the major monuments, the Sun Pyramid and the Feathered Serpent Pyramid. From 1960-1964 a extensive INAH project directed by Ignacio Bernal excavated along the major north-south avenue at the ceremonial precinct, known as the "Avenue of the Dead" by its Aztec name (Acosta 1964; Bernal 1963). Subsequently extensive excavations by the Proyecto Arqueológico Teotihuacan targeted the investigation and restoration of the southern sector of the site from 1980-1982 (Cabrera Castro, et al. 1982a; b; 1991a). These early explorations uncovered most of the previously unexcavated temples, public buildings and palaces over a span of 2 km. Many of these temples, for example the Quetzalpapalotl Palace excavated by Acosta (1964), contained a magnificent array of elaborate mural paintings and stone sculptures from the ceremonial precinct. Such illustrations allude to their rich iconographic tradition (Berrin 1988; Fuente 2006a; Miller 1973).

More recently, intensive excavations at each of the three monumental structures have led to a renewed understanding of the chronology and overall trajectory in the elaboration of this ceremonial center (see discussion below). Two large-scale projects provided the faunal collection analyzed: Proyecto Pirámide de la Luna (PPL) and Programa de Conservación e Investigación en el Complejo Arquitectónico de la Pirámide del Sol (PPS). While no direct analysis of the zooarchaeological dataset was completed by myself from the FSP, I reference materials excavated from the Proyecto Templo de Quetzalcoatl (PTQ) (Álvarez and Ocaña 1993; Valadez Azúa, et al. 2001) to compare them to the faunal evidence available for the other two monuments to complete a holistic understanding of the use of animals at each of the three monuments.

The Moon Pyramid

The Moon Pyramid is the second largest pyramid at Teotihuacan measuring 168 m by 149 m at the base and 46 m in height. This is the only monument situated along the Avenue of the Dead and is at the center of a larger complex called the Moon Pyramid Plaza. This plaza includes several stepped pyramids surrounding the monument, a central altar/platform, and a residential apartment complex to the west that includes the Quetzalpapalotl palace, the Patio of the Jaguars, and Temple of the Plumed Conches. The majority of the faunal remains analyzed for this dissertation come from the Moon Pyramid as it contained a series of four offering caches that incorporated some of the most abundant faunal offerings recovered at Teotihuacan from any single context. As discussed in further detail later, the sheer quantity of the fauna excavated demonstrates these highly symbolic animals had a close association to this monument that is not documented in any of the other structures. But first this assemblage must be contextualized both historically within the trajectory of archaeological explorations conducted as well as the chronological and descriptive elements for each of the dedicatory caches.

Until explorations by the PPL, this monument was the least understood and explored. Most of the previous research was focused on the reconsolidation of the monument. Claimed to be one of the first archaeological explorations in the Americas, this pyramid was superficially explored by Carlos de Sigüenza y Góngora in 1675 when he conducted tunnel excavations, which was left open until 1924 (Schávelzon 1983). Very little is known about these initial investigations, except that it included a pit that was dug around 1.06 m wide with vertical walls, suggesting there were inner chambers, interpreted to possibly have a funerary function (Schávelzon 1983:126). By 1962-1966 when large-scale restoration and consolidation projects were conducted to open the archaeological park, there were no traces of this tunnel nor pit. It is during this time that the monument was superficially excavated and reconstructed to its present form, which included extensive piping and concrete consolidation. From this point forward very little was explored at the monument itself, with only minor conservation and construction projects in the vicinity with the exception of the Quetzalpapalotl palace that was fully explored and reconstructed to be open to the public (Acosta 1964).

From 1998 to 2004, Saburo Sugiyama and Ruben Cabrera directed a extensive excavation and mapping project at the Moon Pyramid (PPL) (Sugiyama and Cabrera Castro 2007). Their project goals were to create a three-dimensional map of the Moon Pyramid Plaza and, based on this map, explore interior and exterior spaces in this plaza to uncover major construction sequences and any associated burial/offertory deposits. They were also keen on locking down some of the earliest periods of the formation of the Teotihuacan state that are not well understood through exploring how and when these state works were constructed. Indeed these project goals led their team to define seven building phases within the Moon Pyramid itself as well as recording minor construction changes in the plaza. These building sequences were labeled Building 1 through Building 7, Building 1 being the oldest and smallest mound at the core of the present monument (Sugiyama and Cabrera Castro 2007). Associated with these remodeling phases, a series of five burial/offering complexes were identified either built along the bedrock layer or in the nucleus of such structures. Such dedicatory caches, all of which had human skeletal elements, were named sequentially in the order they were discovered as Entierros 1 through 6 (Sugiyama and López Luján 2007)[1]. Entierros 1 and 4 are not be discussed as they did not contain any faunal materials. Entierro 1 was a neonate found in a pit in the northwestern corner of the monument (post-Teotihuacan) while Entierro 4 was composed of seventeen decapitated human heads that were placed between Building 5 and Building 6's northern façade during the construction of the latter structure (Sugiyama and López Luján 2007).

Building phases, Entierros and chronology

The earliest phases of Teotihuacan's occupation remains the least understood and excavations at the Moon Pyramid was one of the first excavations to identify early public architecture that were securely dated. The PPL results concur with previous evidence that earlier structures at the Moon Pyramid were built during the Tzacualli and Miccaotli phases (Acosta 1964:46-47; Millon 1973:52) and the last modification of the pyramid took place during the Tlamimilolpa period (ca. A.D. 350) (Millon 1973; Sugiyama and Cabrera Castro 2007). We now know that the Moon Pyramid was built in seven construction episodes and that the first three phases were not of monumental scale but rather were

[1] Both PPL and PPS identified any dedicatory cache with human skeletal remains by their "Entierro" (burial) number while any context without human skeletal remains were assigned an "Ofrenda" (offering) number. These designations do not allude to the cultural interpretation if the deposit reflects a burial or an offering in a strict sense. To avoid confusion I will use their Spanish Entierro and Ofrenda numbers throughout the text.

composed of low platforms. Radiocarbon results date Building 1’s construction to around A.D. 100 ±50, and would have constituted part of the first inklings of the planification of the ceremonial core.

Building 1 of the Moon Pyramid was one of the earliest public structures to be built at the ceremonial core, pre-dating the Sun Pyramid itself (see below). This structure would have been contemporary with some of the pre-Ciudadela structures identified by Gazzola (2009) and Gómez Chávez (2013) and possibly would be contemporaneous with recent evidence of pre-Sun Pyramid structures (Sugiyama, et al. 2013a) although there were no radiocarbon dates available from the later structure to corroborate these results. Interestingly, the east-west orientation of this structure is slightly off from the standard Teotihuacan orientation by four degrees to the north, suggesting this structure and the subsequent few buildings that rotate clockwise predate the large-scale urbanization and standardization that took place, and that the gradualness of this transition had some sort of astronomical reason (Sugiyama and Cabrera Castro 2007).

The subsequent two building phases, Building 2 (A.D. 150±50) and Building 3 (A.D. 130-260), were of modest constructions similar in form to Building 1. During these three phases, the mound only grew from 23.5 m at the base to 31.3 m. They were square platforms with very deteriorated or destroyed facades that made reconstructing the form very difficult. No offertory caches were found associated with these early structures. What is important to consider is the antiquity of this loci with precedence of public structures prior to the large scale expansion of the city itself. These three initial phases, as well as the subsequent Building 4 share several features distinct from the later development: they lack an adosada platform, and they are square in shape with stepped talud at the base.

The construction of Building 4 (A.D. 250±50) coincided with a marked change in not just its monumental size but also a more complex ritualized production process. It was at this time that the earliest two dedicatory chambers associated with this monument were deposited. State monumentalism was established, expanding nine times the dimension of the previous structure (88.9 m north-south by 89.2 m east-west) and integrating highly elaborate offerings of exceptional quality and quantity into the pyramid. One cache was placed along the central axis of the pyramid at the base (Entierro 2) and another

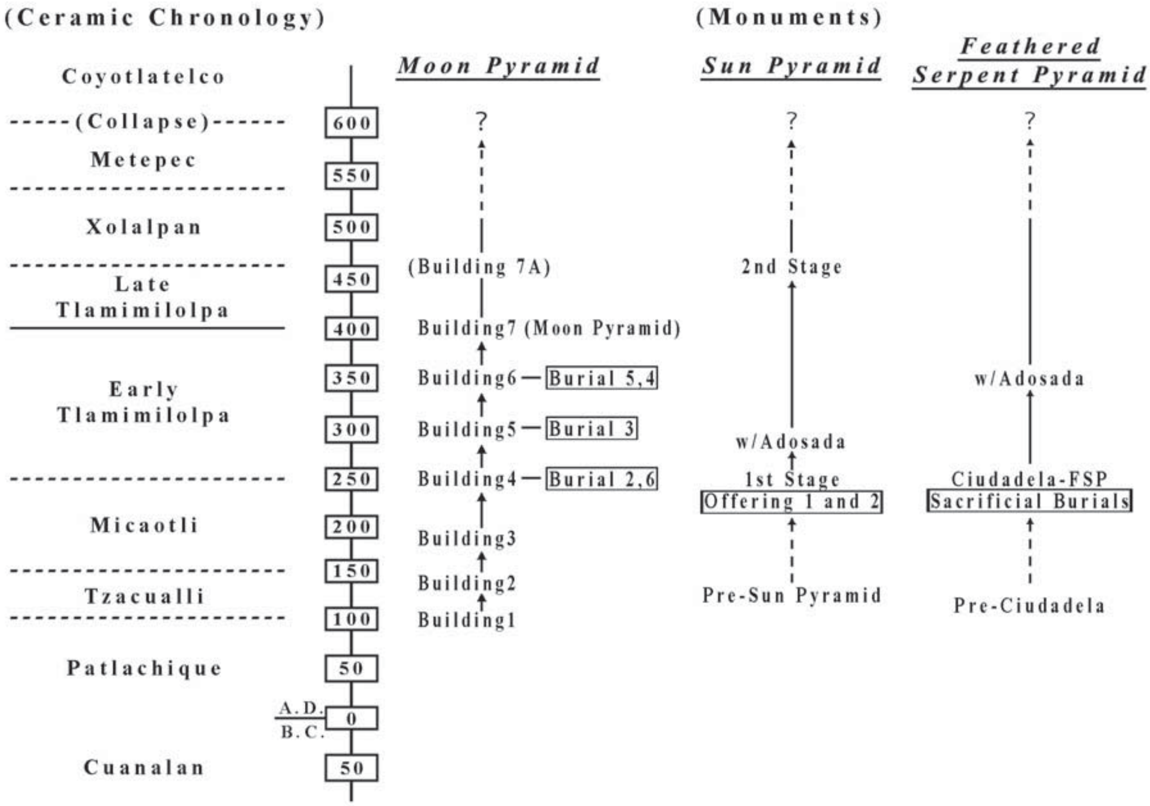

Figure 3.3 Chronology of Teotihuacan correlated with the building phases and offerings (© Saburo Sugiyama).

was embedded roughly at the core of the structure (Entierro 6). By the time this monument was completed, the well-known city-grid system along with its particular orientation was established and both the Sun Pyramid and Ciudadela complex would have been built (Figure 3.3) (Sugiyama 2013b). During this Miccaotli phase, there was a radical change in the extent of state control and legitimation on the populace. The fact that the construction of this building coincides with two of the most ubiquitous and rich faunal remains found to date at Teotihuacan cannot be a mere accident.

Entierro 2 was placed in a dedicatory chamber 3.5 m (north-south) by 3.4 m (east-west) and about 1.5 m high containing an sacrificial victim bound up prior to its deposition seated along the eastern wall (Figure 3.4) (Spence and Pereira 2007; Sugiyama and López Luján 2007). This chamber, much like all the other examples were filled in completely with a matrix of earth and gravel similar to the fill of the pyramid itself. Furthermore, a rich diversity of fauna were discovered within this cache including the complete skeletons of two pumas, one wolf, nine eagles and several rattlesnakes (Polaco 2004). Besides

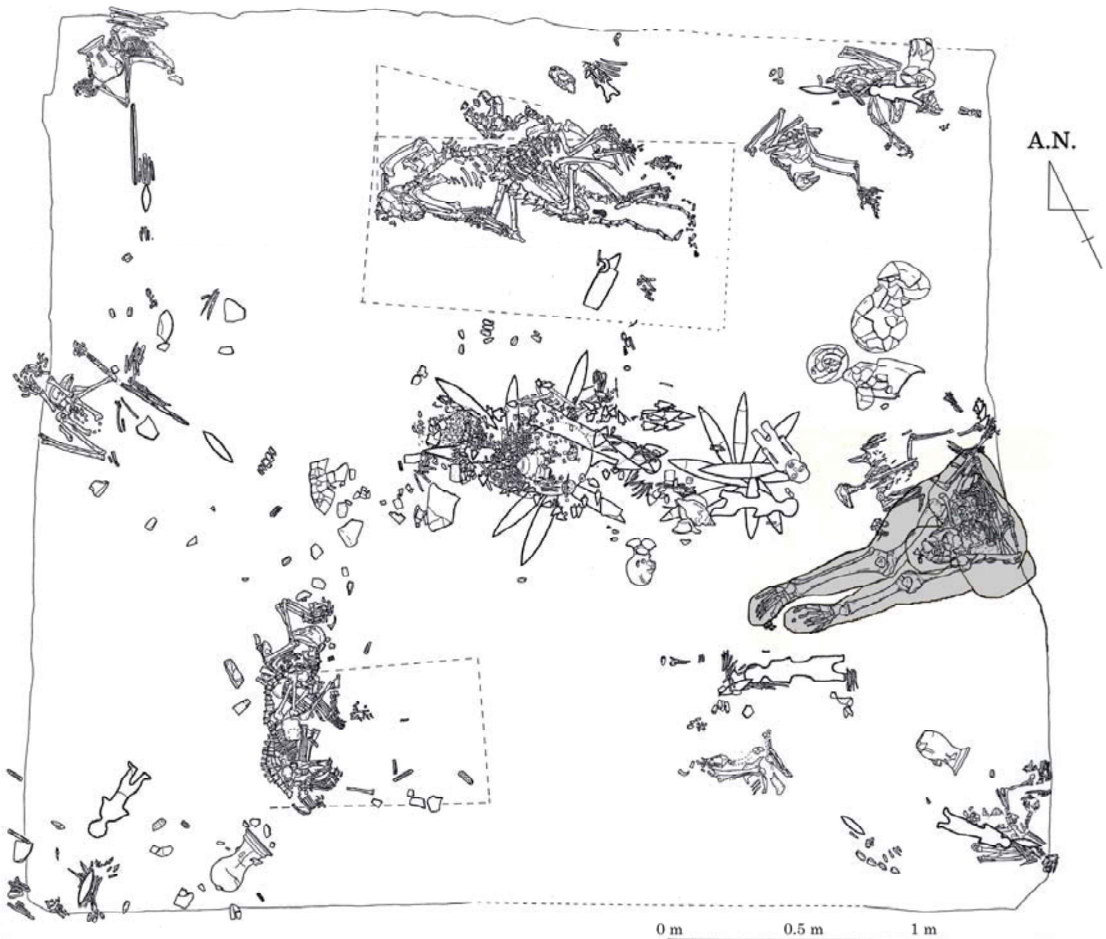

Figure 3.4 Plan view drawing of Entierro 2. © Moon Pyramid Project

these ossuary remains, an exceptional number of offerings were symbolically placed on the floor including obsidian eccentrics, bifaces and projectile points, shell pendants, and Tlaloc vessels (Sugiyama 2004; Sugiyama and López Luján 2007). Most exceptional were the offerings placed near the center that included two greenstone figurines, one female one possibly male, two slate disks, obsidian projectile points, unworked shell, shell necklace of imitation human maxillae and two sets of sacrificial knives radiating from the central greenstone figurines (Sugiyama and López Luján 2007).

Entierro 6 was placed in a large chamber formed by vertical stone walls 5 m (north-south) by 4.5 m (east-west) and 2 m high (Figure 3.5). Most striking were the remains of ten decapitated victims piled up on the northern sector of the cache, and two complete individuals placed towards the center (Sugiyama and López Luján 2007). In total 12 human individuals were deposited, mostly males, some of which had associated artifacts such as greenstone and shell artifacts and osteological alterations such as cranial

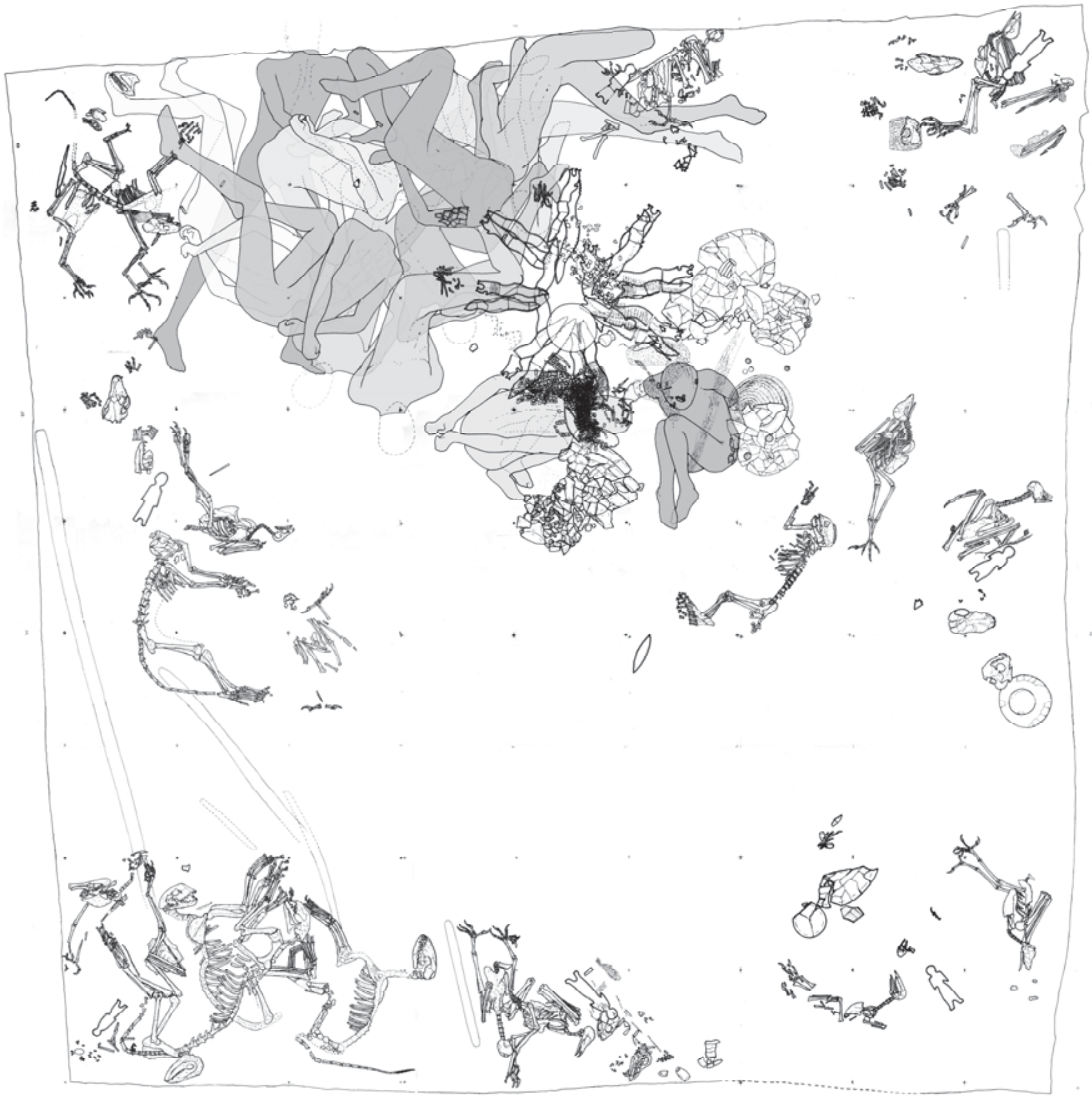

Figure 3.5 Plan view drawing of Entierro 6. © Moon Pyramid Project.

deformation or dental decoration to suggest they were of high status (Spence and Pereira 2007). The magnitude of faunal remains found in this context is unprecedented in Teotihuacan, with over 100 individuals that included a high number of complete animals and other faunal artifact such as modified skull remains. Of course, such faunal material were among a equally rich and unique array of dedicatory artifacts including obsidian eccentrics, jade figurines, and ceramics (Sugiyama and López Luján 2007). Similar to Entierro 2, 18 radiating eccentrics, this time carved in the form of feathered serpents were arranged around a pyrite disc and a greenstone mosaic figurine (Sugiyama and López Luján 2006a).

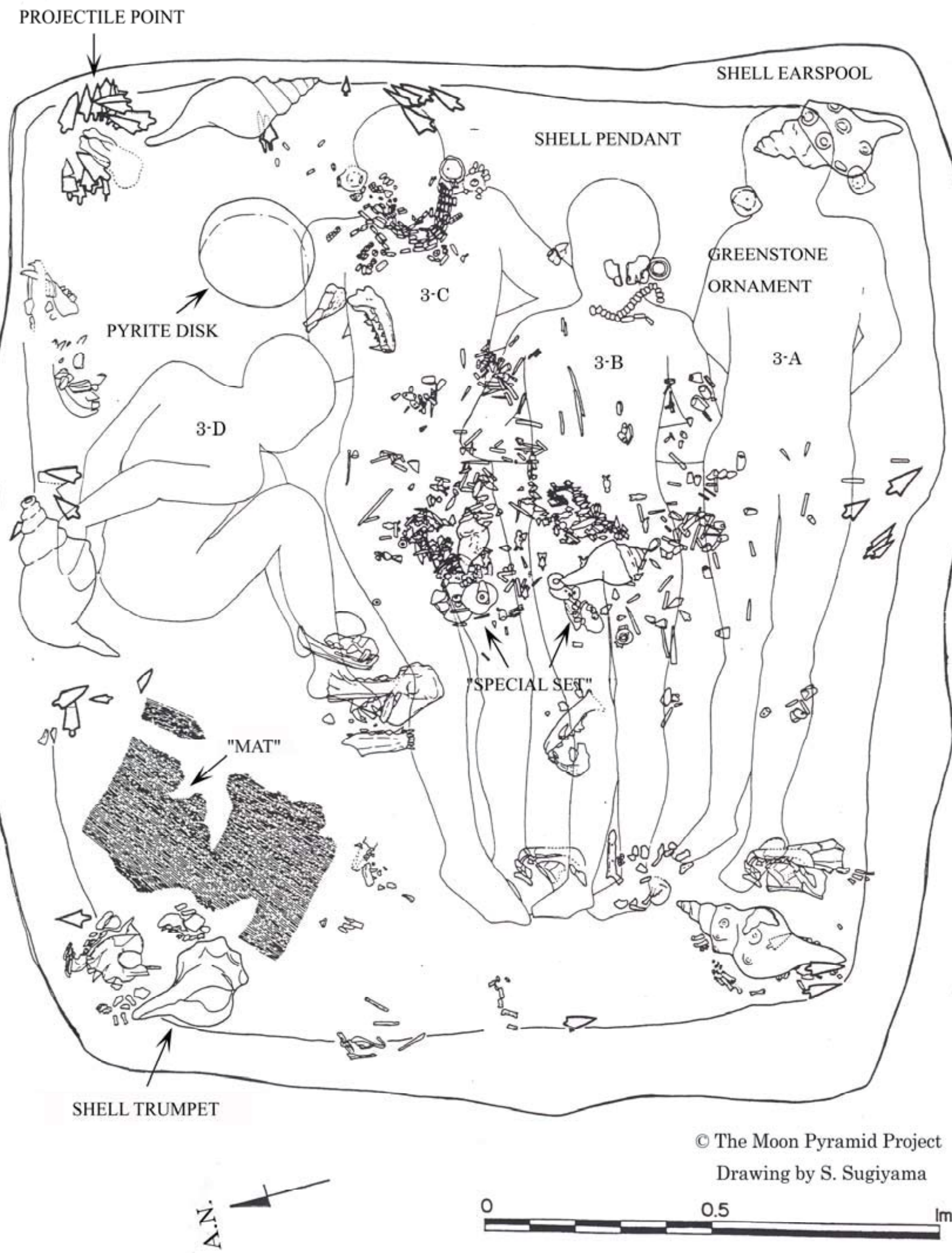

Figure 3.6 Plan view drawing of Entierro 3. © Moon Pyramid Project

Similar to Entierro 2, 18 radiating eccentrics, this time carved in the form of feathered serpents were arranged around a pyrite disc and a greenstone mosaic figurine (Sugiyama and López Luján 2006a).

Building 5's construction incorporated, for the first time, an adosada platform connected to the central structure and the adoption of a very typical Teotihuacan talud-tablero form (evidence is unclear in

Building 4) (Sugiyama and Cabrera Castro 2007:120-121). This addition caused an elongation of the north-south axis to 104 meters, while the east-west axis essentially stayed the same. This building was probably constructed around A.D. 300±50, at which point Entierro 3 (2.2 m north-south x2.5 m east-west, 1.5 m deep) was integrated into Building 5 along the back façade. It consisted of four sacrificial victims interred with associated rich offerings, including many prepared animal heads (Sugiyama and López Luján 2007) (Figure 3.6). Again, the osteological and isotopic data concur with the scenario that these were composed of male captive warriors (Spence and Pereira 2007; White, et al. 2007). Each of these individuals possessed body ornaments such as shell and greenstone ears-pools, shell necklaces made of imitation human maxillae. General offerings such as worked shell ornaments, obsidian projectile points and blades, pyrite disk, greenstone figurines, and small anthropomorphic figurines (Sugiyama 2004; Sugiyama and López Luján 2007).

Entierro 5 was deposited immediately prior to the construction of Building 6 after the termination of Building 5 at the top of the monument. This burial was found in 2002 when a tunnel was set in the upper section of Building 5 that exposed a large pit-offering complex on the upper floor measuring 6 m^2 and 3.5 m deep (Sugiyama and Cabrera Castro 2007). The remains of three figures seated cross-legged adorned with exceptionally rich ornaments that point to the highly elevated status of these individuals made this offertory complex particularly unique (Figure 3.7). Unlike all the sacrificial victims from the other caches, these prominent figures did not have their hands tied behind their back. In fact, their hands were crossed in front, two of the individuals overlaid on top of animal skulls (Spence and Pereira 2007:151). Personal paraphernalia included atypical and highly controversial Maya-style greenstone objects including jadeite “pinwheel” ears-pools and pectorals usually found in Maya contexts that may indicate the sociopolitical authority of the individuals from this foreign region (Sugiyama and López Luján 2007). Complete animals were placed in front of each of the three individuals and scattered remains of more animal skulls and particularly rattlesnakes were found throughout the cache. Other artifacts placed in this chamber included a seated greenstone figure with associated greenstone beads, worked and un-worked shell, obsidian points and blades, and woven fibers.

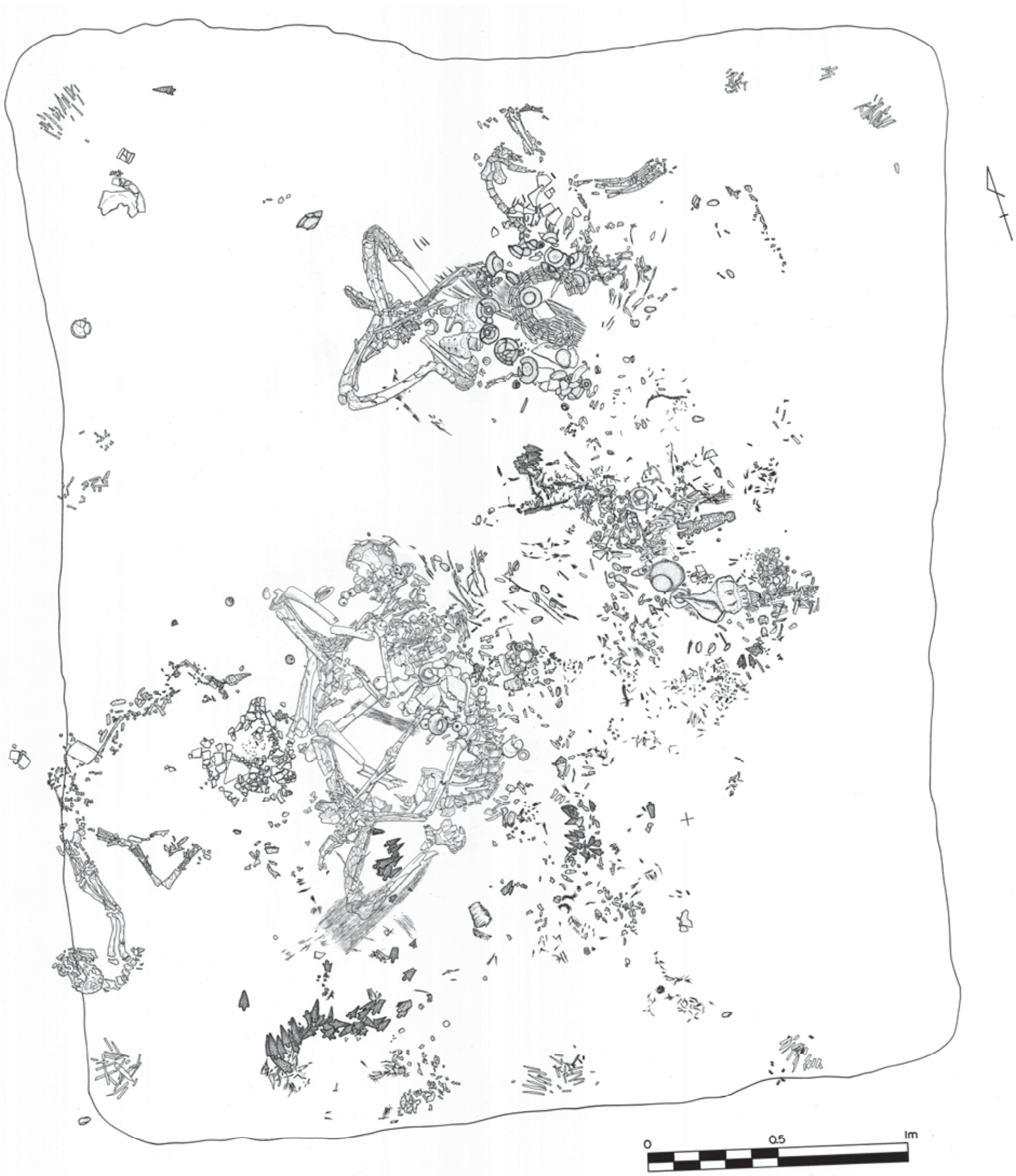

Figure 3.7 Plan view drawing of Entierro 5. © Moon Pyramid Project.

Without a roof, this cache was completely filled in with earth, stones, and large rocks during the construction of Building 6. Unfortunately, the large boulders that were set into fill this cache caused some extensive taphonomic damage to the faunal remains, probably due to the water leaching, making this collection by far the most degraded collection out of all the burials analyzed thus far. This deposit marked not only a termination of Building 5, but located at approximate three dimensional center of Building 6, served as a foundation ritual for Building 6 that was carried out sometime around A.D. 350 ± 50 (S. Sugiyama and Cabrera Castro 2007). This construction resulted in creating a monument almost the same form and size of the pyramid visible today. It is during this time that Entierro 4, consisting of 17 decapitated heads, was also integrated into the construction along the base.

Most of what is currently visible of the monument dates to the construction of Building 7, which was probably built sometime around A.D. 400±50 and continued to function until the collapse of the city in AD 550/650 (Sugiyama and Cabrera Castro 2007:122). Even after the decline of the Teotihuacan state the monument continued to be used, reoccupied, worshiped, and/or looted in subsequent periods, particularly by the Aztecs (Sugiyama and Cabrera Castro 2007:122). The presence of Entierro 1, located just outside of the northwestern corner of the monument further emphasizes the longevity of the place of the Moon Pyramid even after the collapse of the socio-political structure. All fauna from dedicatory contexts from the Moon Pyramid was analyzed, that cover a span between Building 4 to Building 6 (A.D. 250±50 to A.D. 350±50). This allows us to look at diachronic changes in animal use over time.

The Sun Pyramid

The largest monument in the Mexican Basin stands to the south of the Moon Pyramid to the east of the Avenue of the Dead. Due to the expansive size of the monument, this structure was the first monument to be reconstructed by a Mexican archaeologist over a century ago (Batres 1906) and has remained as a staggering national symbol. This pyramid faces west, oriented to align with the Pleiades star (Millon 1992) and the orientation of the sun set on the western horizon 15 and a half degrees north of west on August 12th and April 29th, coinciding with the 260 day calendar (Drucker 1977).

Explorations at this major monument began over a century ago by Batres (1906) to reconstruct the pyramid in time for the centennial celebration of the Mexican independence under the auspiciousness of the president Porfirio Díaz. During this initial excavation, Batres (1906) described children buried at the four corners of each body of the monument, and characterized the monument as built in a single stage by a homogeneous fill with adobe bricks surrounding the exterior layers. The reconstruction of the monument to its present form has been the basis from which subsequent excavations have worked to define the construction sequence, meaning and function of this mega-monument.

With heightened awareness of the monument, now imposing on the landscape with the newly reconstructed concrete walls, several projects began exploring the interior spaces to find tombs or special features. Manuel Gamio (1922) began digging from the posterior, eastern façade at the surface level at the time (approx. 6.8 m higher than the current surface level) that was supplemented by a short tunnel near the end of Gamio's tunnel running northward (Vaillant 1932; 1938). Subsequently Eduardo Noguera (1935; Pérez 1935) initiated another tunnel from the frontal, western façade, just above the bedrock level in an attempt to reach the axial center along the base at the surface level. Although he stopped short of this goal, this tunnel was connected by a flight of stairs to Gamio's previous exploratory tunnel.

Later, Remey Bestien (1947) excavated at the end of Noguera's tunnel that ran northward. Subsequently in 1959, Millon and his team re-examined old profiles from Gamio and Noguera's excavations and proceeded by placing several test pits to encounter early walls in the fill of the monument (Millon and Drewitt 1961). These explorations confirmed Batres's (1906) characterization of the earth filled monument, but also defined early features and even small offering deposits within the fill of the monument (Millon and Drewitt 1961; Millon, et al. 1965; Noguera 1935; Pérez 1935). Besides small consolidation and restoration projects, the monument's interior remained unexplored for the remainder of the time and the focus shifted to the exterior spaces in the Sun Pyramid Complex, as well as on a subterranean structure that runs below the monument.

For the opening of the archaeological park, a large-scale excavation and restoration project led by Ignacio Bernal (1963) uncovered associated buildings around the Sun Pyramid plaza complex. Along with interior excavations in Noguera's tunnel, two other trenches were dug in the pyramid's exterior. A trench 31 m in length was set along the upper body of the monument and a 11.5 m long trench on the north side of the pyramid's base (Smith 1987c). In 1968 the Teotihuacan Mapping Project continued exploring this upper tunnel (TE 22) (Rattray 1975; 2001:55-57).

Heightened interest proceeded when a subterranean structure, erroneously identified as a “cave”, was accidentally discovered in 1971, opening new interpretations to the use of the monument. This subterranean feature is characterized by a shaft that shoots straight down into the bedrock layer for about 6.5 m into a large opening with a talud structure, where the stairway entrance would have been (Sugiyama, et al. 2013a). From this large opening, a long horizontal tunnel 97.4 m long meanders toward the general east direction until it reaches the four pedaled terminus. A series of 17 walls would have closed off access to this quadripartite space, suggesting this area was not accessed until later looting activities took place.

There are only scant information about the primary excavations not only due to the extensive looting activities in antiquity but also because the archaeologist Jorge Acosta who was in charge of the project passed away soon after the discovery without documentation of their finds. Some have resorted to interpreting this subterranean tunnel in connection to later Post-Classic myths related to sacred cave symbolism (Heyden 1981; Millon 1992; Taube 1986). Later test pit excavations by the Teotihuacan Mapping Project members describe the presence of stone drainage channels, manhole-type covers, shell and tiny fish spines (Millon 1992:387). They also describe multiple floor layers suggesting the subterranean tunnel was utilized over time even after the sequence of walls leading to the central quadripartite space would have been filled in, blocking access to this area (Sload 2007; Sugiyama 2011).

Due to the extensive looting and minimal data available from previous excavations inside the monument and this subterranean feature, the focus of investigation shifted again to the Sun Pyramid complex, first by Eduardo Matos (1995), then again by Alejandro Sarabia (2002). Such projects focused on peeling away post-Teotihuacan layers, particularly on the north and east sides of the monument and surrounding platforms, as well as the restoration and consolidation of the original façades. It is in this context that the project entitled Program of Investigation and Consolidation at the Architectural Complex of the Sun Pyramid, Teotihuacan (Programa de Conservación e Investigación en el Complejo Arquitectónico de la Pirámide del Sol, PPS) was formed in 2005 (Sarabia G. 2008).

The PPS directed by Alejandro Sarabia (2008) focused primarily on the preservation and exploration of the architectural unites surrounding the monument. With the integration of Saburo

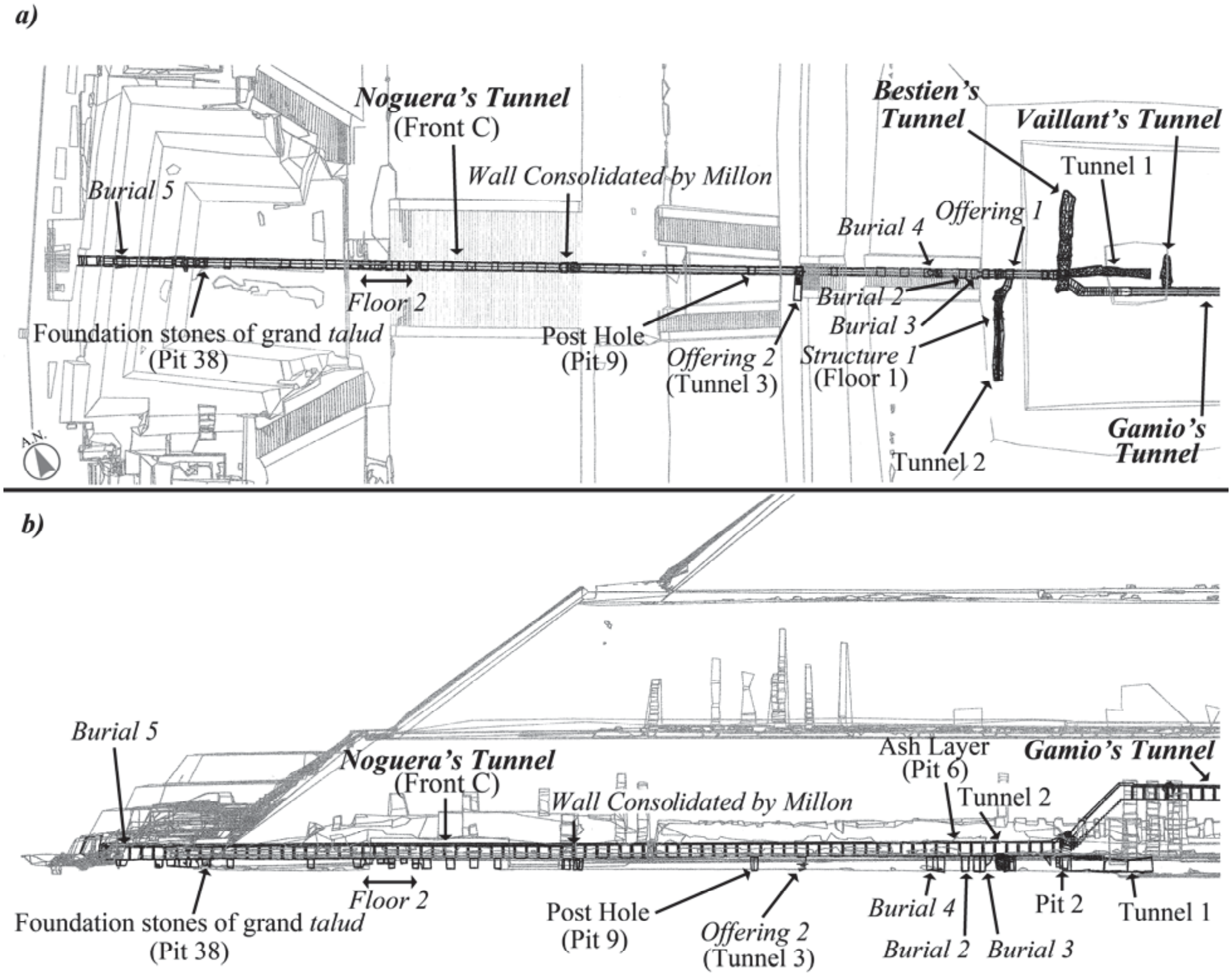

Figure 3.8 a) Plan view and, b) profile of excavation units and key features identified by the PPS (CAD drawing by Moon Pyramid Project © Saburo Sugiyama).

Sugiyama and his team in 2008, the project began to investigate the interior spaces within the monument. From such intensive excavations, 59 test pits and three tunnels, we were able to understand the complex construction sequence and use of the monument prior to, during and after the production of this major mound (Figure 3.8) (Sugiyama, et al. 2013a). In relation to this monument, a couple of test pits were also dug in the subterranean tunnel, allowing us to understand the relation of this feature to the pyramid.

Building phases, Entierros/Ofrendas and chronology

One of the major contributions of the PPS includes the revised chronological designation assigned to the construction of the Sun Pyramid. Originally, it was proposed that this monument was built relatively early in the city's occupation around the Tzacualli period (A.D. 1-150) or earlier (Millon 1960;

Millon, et al. 1965; Noguera 1935; Vaillant 1938). New radiocarbon dates suggest that the monument, and most likely the subterranean tunnel as well, were constructed around A.D. 150-300, pushing back the construction sequence by about a century (Sugiyama, et al. 2013a:423-428). Furthermore, these excavations led to define the monument's construction sequence in three phases: a Pre-Sun Pyramid phase, the establishment of the main corpus of the monument, and the addition of the adosada platform. Similar to the Moon Pyramid, these excavations also identified a series of dedicatory caches (Sugiyama, et al. 2013a). In total four Entierros, three of which were of infants and children, and two offerings were explored. Two of the Entierros and all of the offerings date to the phase associated with the construction of the monument. Unlike the materials from the Moon Pyramid, the human skeletal remains were usually not associated with large offerings, but were isolated individuals buried with none or only scant associated artifacts (Sugiyama, et al. 2013a). The faunal remains discussed in this dissertation were recovered from Offering 2, which most likely were the result of a consecration ritual that initiated the construction of this major monument in one building episode.

Placed within a large pit (1.75 m^2) dug partially into the hard bedrock later, Offering 2 was located slightly to the south of the main east-west axis 85 m from the entrance of Noguera's tunnel. The offering cache was first identified within the fill of the monument by a concentration of obsidian blades, several worked spiral shells, and an abundance of organic fibers. Extending the excavation unit, this offering resulted in the discovery of exceptionally rich and unique artifacts (Figure 3.9). Multiple layers of objects were found superimposed in several concentrated areas composed of a diverse array of material types such as obsidian, green stone, shell, pyrite, slate, ceramics, animal bones, and an abundance of organic residue throughout the dedicatory chamber (Sugiyama, et al. 2013a). Most exquisite was the greenstone artifacts which included one mask with pyrite eye inlays and two anthropomorphic figurines. What is distinct about this offering in comparison to the Moon Pyramid materials is the lack of any human skeletal remains, thus its designation as Ofrenda 2 and not an Entierro.

Even after the completion of the main body of the pyramid, just like the Moon Pyramid, we see episodes of major modifications and amplification of the monument. Some point after the corpus of the

Figure 3.9 Plan view of Ofrenda 2 (drawing by Nawa Sugiyama, Osiris Quezada, and Saburo Sugiyama).

Sun Pyramid was constructed, an adosada platform was annexed, covering other pre-adosada structures (Sugiyama, et al. 2013a:422-423). Exterior excavations in the adosada, as well as on the apex of the monument record a complex construction sequence that demonstrates subsequent construction projects continued throughout the Teotihuacan occupation (Sarabia G. 2002; Sarabia G. and Sugiyama 2009).

Zooarchaeological remains uncovered from this monument are less abundant and only one of the two offerings had any faunal materials. None of the Entierros had faunal objects. The minimal use of fauna in ritual deposits at this monument compared to the Moon Pyramid is very noticeable. This probably had to do with the function and meaning attributed to each of the different monuments. It is unfortunate that very minimal information is available concerning the materials placed in the subterranean tunnel, as there is only scant information about the presence of aquatic species in the form of fish scales/spines excavated from this area (Millon 1992:387). Certainly the remains of such micro fauna would be possible to recover through future excavations, as they would be the type of materials often left behind by looters.

The Feathered Serpent Pyramid

At the southern sector of the ceremonial precinct, within the Ciudadela complex, the Feathered Serpent Pyramid (FSP), also known as the Temple of Quetzalcoatl, stands 66 x 66 m at the base and 20 m high. The complex is expansive, covering 16 ha, and has been interpreted to be where state-level ceremonies took place. A large palisade wall surrounds this complex and the main monument stood between two residential complexes on either side. Similar to the other monuments at the ceremonial precinct, initial explorations began with large scale trenching and reconstructions, in this case by Manuel Gamio (1922) who dug a tunnel to expose the great serpentine sculptures along the western (frontal) face for the first time. Subsequent excavations found human skeletal remains with rich offerings including marine shells, lithics, slate disks with traces of pyrite, and greenstone artifacts (Dorsal 1925; Gamio 1922).

From 1980-82, an INAH project called the Proyecto Arqueológico Teotihuacan (PAT), directed by Rúben Cabrera (Cabrera Castro, et al. 1982a; b; 1991a) excavated the southern sector of the city's core, including many of the structures that Gamio had not excavated in the Ciudadela. During this project, several more Entierros were discovered along the foot of the pyramid which inspired the formation of a new joint project called the Proyecto de Templo Quetzalcoatl (PTQ 1988-1989) (Sugiyama 1989). This project was formed in order to explore this monument more intensively under the coordination of Cabrera, Cowgill and S. Sugiyama. Tunnels were dug into the central adosada platform and additional trenches were placed surrounding this structure (Cabrera Castro and Cabrera 1991; Cabrera Castro, et al. 1991b).

One of the most striking discoveries resulting from the PTQ excavations were the remains of ca. 137 individuals excavated both in and around the pyramid that included an exceptional assemblage of associated offerings (Sugiyama 2005). These sacrificial victims were carefully laid out in significant groupings relating to cosmologically important numbers and were composed of mainly males that were foreign, possibly war captives, that were sacrificed in dedication to the monument (Sugiyama 2005; White, et al. 2002). The identification of these individuals as war captives was also supported by the abundant ornamental assemblages related to military regalia such as projectile points and even human maxillary pendants. Some of these maxillary pendants were either imitations made from shell or composed of canid or human maxillae or mandibles (Valadez Azúa, et al. 2001).

Building phases, Entierros and chronology

As was the case with the Sun Pyramid, it is becoming more and more obvious that the Ciudadela complex also had many pre-existing structures prior to the consolidation of this complex into a monumental locus where the FSP was constructed. At least three stages can be identified in this complex. A Pre-FSP phase, a FSP phase where the main corpus was built, and an adosada construction stage where the main façade of this monument was covered over by this platform.

Sugiyama (1998a), Gazzola (2009) and Gómez Chávez (2013) have identified pre-FSP/ciudadela structures including masonry constructions (perhaps monumental) and canal system. These features, with at least two architectural stages, dated to the Patlachique and Tzacualli phases (Gazzola 2009; Sugiyama 1998b). It is during the Tzacualli phase that this area was utilized by elites with ample access to divers resources (Gazzola 2009:227). It is interesting to note that like Building 1 of the Moon Pyramid, these building complexes that date to a similar time frame had a distinct orientation from the typical

Teotihuacan orientation, aligned 11.5 degrees east of magnetic north while later Teotihuacan orientations were aligned to 15.5 degrees east of north (Gazzola 2009; Sugiyama and Cabrera Castro 2007).

It is during the Miccaotli phase (around A.D. 200) that these pre-Ciudadela structures were destroyed, almost completely, to build the main body of the Feathered Serpent Pyramid. A sacrificial ritual took place before the construction of the FSP (Sugiyama 1998b) that provides the most convincing evidence of mass sacrificial rituals in Mesoamerica. This sacro-religious act marked the foundation from which this highly symbolic monument was constructed.

Around the fourth century A.D. the western façade of the monument was concealed with the amplification of an adosada platform that was probably an indication of a ritual and political transformation (Cabrera Castro 1998; Sugiyama 1998a). Such dramatic changes can be identified through evidence of the demolition and burning of the old temple, the looting of several of the dedicatory complexes and, above all, the defacement of the large feathered serpent sculptures on the facades (Sugiyama 1998b). Such a transformation, particularly the defacement and burning of such elaborate and expensive stone sculptures have been used to argue for a shift in the political structure and change in the focus from the Feathered Serpent symbolism at the southern sector of the city to a distinct suit (Cabrera Castro 1998; Sugiyama 1998a).

Zooarchaeological investigation of some of the fill material from this monument (Álvarez and Ocaña 1993) as well as a more extensive analysis of these canid necklaces have already been conducted (Valadez Azúa, et al. 2001). While this sample was not studied as part of the dissertation project, this dataset provided a useful comparative example in relation to the Moon Pyramid and Sun Pyramid collections. To begin, it is apparent that there is a staggering lack of zooarchaeological remains from ritual contexts from this monument, particularly in comparison to the Moon Pyramid assemblage. The only noteworthy materials that are comparable to the elaborate display of faunal materials found at the Moon Pyramid are the canid maxillary pendants that adorned some of the sacrificial victims. This collection is particularly relevant to understand some of the cranial remains from Entierro 5 that also consisted of composite elements, which is discussed in more detail in Chapter 6.

Producing Monumentality at Teotihuacan

As described in Chapter 2, each of these monuments were active places on the landscape that were activated, defined, and re-defined throughout the occupation of Teotihuacan and even in the present continue to be active constructs that define the socio-cultural landscape. Integral to understanding the function and meaning of these monuments is reconstructing the actions that transformed these locations into empowered and animate symbols of Teotihuacan imperialism and domination. This dissertation closely examines the dedicatory rituals as one of the arenas where such power structures were reified and argues that animals were active participants in such acts at differing degrees throughout the production of each of the major monuments at Teotihuacan. Teasing apart how the use and production of animals changed within the context of building monumental entities helps disentangle this question.

The present chapter contextualized the archaeological evidence to construct a chronologically situated narrative of the physicality of how the monuments were built and consistently modified. Furthermore, this chapter introduced the evidence available from each of the dedicatory rituals that took place during the production of these monuments. This information allows us to key in on a particular point in the development of the Teotihuacan sate, during the construction of the ceremonial center marked by the three large monumental structures that orient the ritualized landscape. This period marks the quintessential period for concreting prevailing state ideologies to an unprecedented scale, and thus provides an opportunity to reconstruct some of the social processes during the definition of these monuments as essential places that embodied these newly arising social relationships.

The rich archaeological data available from excavations at each of these monuments provide a unique opportunity to reconstruct the remains of individual animal subjects with tight spatial-temporal control. Such information is necessarily for the type of life history reconstruction approach taken in the present study. In continuation, I describe the zooarchaeological methodology applied and introduce the main actors under consideration in the present study.

CHAPTER 4

Strategies: Zooarchaeological Inquiry and Introducing the Actors

This chapter introduces the methodological parameters utilized for the zooarchaeological analysis that is the foundation of this dissertation. I also briefly discuss what faunal research has been conducted at Teotihuacan, which compares the species distribution of domestic refuge from ritualized contexts. Subsequently, a casting of the main actors of the ritual spectacle is presented. This includes the species biological, ecological and behavioral characteristics, and how species, age and sex were determined. If the animal has been identified from other contexts and its symbolism within the greater Mesoamerican context is also introduced. While there was some faunal diversity in dedicatory contexts, there were particular key actors that were emphasize in multiple contexts: the felids (pumas and jaguars), the canids (mainly wolves), the raptors (particularly eagles), and the rattlesnakes. These animals were the main focus of the dissertation, as I argue that these species were converted into state symbols integral to the concretion of Teotihuacan's state ideology onto the ritualized landscape.

Zooarchaeological Inquiry

The analytical technique utilized in this study follows standard zooarchaeological practice (Reitz and Wing 2004) on every specimen found in offering contexts from two projects: Proyecto Pirámide de la Luna (PPL) and Programa de Conservación e Investigación en el Complejo Arquitectónico de la Pirámide del Sol (PPS). An effective reconstruction/consolidation and recording system for the faunal remains has been devised in collaboration with Raúl Valadez and his team at the Universidad Nacional Autónoma de México (UNAM) whom conducted the faunal analysis of the materials from Burial 6 with myself[1]. Further guidance was provided by Oscar Polaco from the Instituto Nacional de Antropologia e Historia (INAH). As the materials were excavated over the course of various field seasons by the two projects (PPL 1998-2004, PPS 2008-2010), recovery and reconstruction/consolidation procedures varied. However, as all the materials were analyzed or re-analyzed by myself following the same standard

[1] Collaborators include Alicia Blanco, Gilberto Pérez, Bernardo Rodríguez, and Fabiola Torres.

procedures explained below, this assemblage provides a unique opportunity to compare between the different contexts.

Recovery of the fauna from Burials 2, 3, and 5 were supervised by Oscar Polaco and other zooarchaeologists from the Archaeozoology Laboratory (INAH)[2] while on-site identification and excavation of materials from Burial 6 were conducted by Raúl Valadez and his team from the Paleozoology Laboratory (UNAM). The materials from the Sun Pyramid were excavated and analyzed by N. Sugiyama. Each animal was drawn *in situ* by the archaeologists on site, photographs taken, and were assigned an Elemento number for each bone concentration, usually reflecting an individual animal[3]. The presence of zooarchaeologists on-site were key for such designations, but several of the contexts proved to be difficult considering the very fragmentary and degraded state of the remains. This was particularly the case for Burials 3 and 5, making total minimum number of individuals (MNI) counts difficult. In such cases, approximate clusters of bone concentrations were grouped and designated separate Elemento numbers. Needless to say animal remains from multiple individuals were sometimes found mixed together, but the careful drawings permitted re-assembling some of the isolated bone fragments.

Due to the pristine primarily context, the careful contextual data recorded and the meticulous excavation techniques applied, it was possible to reconstruct individuals *in situ*, within the rich archaeological framework that it was found. Designating bone assemblages into distinct animals permitted unraveling the complex life histories of individual animals, beyond the conventional analysis of just the *chanîe opératoire*, the process of acquisition, preparation, utilization and discard. Such animal biographies focuses on the individual as a live entity permitting the interpretation of the animal within the theoretical framework discussed in Chapter 2 as ontological subjects.

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[2] Other participants included Felisa Aguilar Arellano, Maria Teresa Olivera Carrasco and Norma Valentín Maldonado.

[3] "Elemento" numbers refer to artifact numbers assigned in the field for all object with provenience. This differs from elements in the anatomical sense utilized in zooarchaeological analysis. I will refer to animal concentrations defined in the field by its unique Elemento number to distinguish with this term and the anatomical designation of a bone element.

Consolidation/Reconstruction

The materials analyzed in this dissertation originate from very unique contexts, in dedicatory caches associated with some of the most exquisite artifacts considered part of Mexico's national heritage. Thus their full recovery, restoration, reconstruction and preservation of the collection as a whole was a major concern for the project. Already many of these fauna have been utilized in museum exhibitions and long term preservation and appropriate storage conditions was a central factor in devising the methodology applied. Due to the major differences in the preservation between contexts and even within the same burial, extraction and consolidation/restoration procedures varied. Some individuals were recovered complete, with very little need for any further manipulation than simple cleaning with a dry brush and piecing. Others were lifted as a block, avoiding the entire skeleton from deteriorating. Information about the restoration and piecing procedures for each individual was recorded in the database. Here I summarize the consolidation methods applied on each burial that correspond to the different analysts that were in charge of the collection.

Protocol for the consolidation and restoration of Burial 6, being the first collection analyzed, was devised with Raúl Valadez and his team (UNAM) with the aid of Maria Luisa Mainou from the Escuela Nacional de Conservación y Resturación. This collection was one of the better preserved contexts from the PPL, resulting in many intact remains that were completely restored. However, there were plenty of very fragmentary and sometimes even pulverized specimens that required extensive treatment. This included the use of two consolidants invented by Mainou called Reconos^{110} and Reconos^{220} (both diluted in distilled water 1:1), the former dripped onto the bones directly during the initial cleaning and extraction of the remains to enable manipulation of the specimen and the latter applied submerged overnight to solidify. In the beginning all specimens underwent the same consolidation procedures, leaving one dental and one bone fragment untreated, but subsequently consolidants were applied only on poorly preserved specimens. Once the faunal remains completely dried, fragments were pieced together, in the beginning with conventional glue (Resistol 850) that was later revised to the use of Paraloid B-72. In all cases photographic records were kept prior-to and post-consolidation/preservation.

Burials 2 and 3 had already undergone some restoration and consolidation procedures by INAH personnel when I began analysis. This included its submersion into conventional glue (Resistol 850) diluted with water (unknown concentration) overnight prior to piecing it with the same glue. Samples that have obviously undergone this procedure are recorded in the database, identified by the transparent layer on the surface. Burial 5, although housed at the INAH laboratory seemed to not have undergone consolidation prior to my analysis. Subsequent consolidation protocols were recorded in the database. Some did not need any consolidation, others only applied Reconos^{110}, and only in extreme cases was both Reconos ^{110} and Reconos^{220} employed. These materials were later glued with Paraloid B-72.

Once the specimens were consolidated and re-pieced, the collection was arranged in anatomical orientation to facilitate analysis, coding and photography. Then materials were placed into a white sponge (Ethafoam) in this layout, facilitating identification and display for later studies or for museum exhibition. This type of storage strategy prevents further fragmentation during transportation and is apt for long-term usage. Final storage conditions were photographed, providing a basis to monitor long term changes in the faunal collection (missing elements, consolidation status, discoloration, etc.).

Coding and Database

During analysis each individual was coded: species, size class, age, sex, presence/absence of surface modification and its location, element distribution, consolidation procedures utilized, and bone measurements. All of the data collection sheets and coding into the database was conducted in Spanish. The data were entered into a database (Microsoft Access) created and managed by myself coded in a manner similar to BONECODE (Meadow 1978a). Templates were used to record the locations of pathologies and any other surface modifications as well as the presence/absence of elements. Two levels of identifications were coded for each individual into the database, one that contains contextual information including basic data recovered (species, size class, etc.) and another that contained specific data pertinent to the species in question. For example, particular cranial and postcranial element measurements, fusion levels, and presence and measurements of deciduous dentition for each of the faunal categories (felid, canid, avian materials, and snakes) were taken dependent on the physiological characteristics of the specie in question. Combined, the database was useful for queries and statistical analysis at both general levels across contexts and species, as well as within a particular burial or animal.

While the majority of the assemblage discussed in the dissertation were from primary contexts, some fauna were mixed in with burial fill. They represent either material that were incorporated into the original fill matrix, or isolated bone fragments that were not recovered *in situ*. As these materials represent a mixture of primary (immediate discard), secondary (transfer from locus of origin) and tertiary deposits (re-deposition of transported materials), we must examine the faunal record considering all the possible natural and cultural processes that may have affected the assemblage (Meadow 1978b; 1980). In the future, it may be helpful to compare this context with the faunal remains from the fill matrix recovered from the tunnel excavations. In continuation, I discuss each of the properties coded in the present study.

Taxonomic Identification

Accurate taxonomic identification is crucial to understand which species were selected for ritual purposes and compare them to the species distribution found in the habitation sites (Starbuck 1975; 1987; Valadez Azúa 1992) and the natural environment in the Teotihuacan Valley (Gamio 1922:42-49). Identifications are largely based on morphological and metric distinctions identified in the literature (Blanco Padilla, et al. 2009; Elbroch 2006; Gilbert 1990; Gilbert, et al. 1985; McKusick 2001; Olsen 1968; 1982; 1990; Serjeantson 2009). Furthermore, I consult the comparative collections housed in the Paleozoology Laboratory (UNAM), the Arqueozoological Laboratoy in the Instituto Nacional de Antropolgía e Historia (INAH) (Álvarez and Ocaña 1991) and the mammalian collection from the Biology Institute (UNAM) (Cervantes, et al. 2009) in Mexico. Supplemental identifications were conducted utilizing collections at the Museum of Comparative Zoology and the Zooarchaeology Laboratory (Harvard University) in the USA. Selective measurements were taken based on von den Drisch (1976) with minor modifications based on other sources (Blanco Padilla, et al. 2009; Isidro Luna 2007; Montserrat Morales-Mejía, et al. 2010).

Coding the taxonomic designation was completed at the class, order, family, genus and species level. As described below, while there is some diversity in the species represented, the majority of the primary burials and offerings placed in the caches were standardized species repeatedly utilized in all three monuments.

Age and Sex

Determining the age and sex of each animal are important to understand the selection process. Such information can help interpret the symbolism behind each species (females/fertility vs. males/warfare) and the hunting and capturing protocols. Aging and sexing animal bones is often difficult and species specific differences requires the implementation of independent strategies for each of different taxa involved (Crowe 1975; Gay and Best 1996; Jolicoeur 1975; Silver 1969). A unique coding system allowing for this intra-species variation has been devised, particularly allowing for the precise recording of morphometric traits discussed below.

Age designations of seasonally breeding animals are particularly useful for determining seasonality (Legge, et al. 1991; 2000). The age of mammals are recorded based on growth and structural changes in bones and teeth during development. They rely primarily on the level of fusion along growth plates on bones, the growth and size of the bones and the eruption and wear sequence of teeth. In the present study the presence/absence and the degree of fusion was recorded as; not relevant (no fusion plate in this bone/specie), fully fused, mostly fused, over ½ fused, less than ½ fused, barely fused, and unfused. For mammalian species where tooth eruption and wear sequences are incredibly useful for age determination, the presence/absence of teeth, their measurements and the degree of wearing when discernible was characterized. Luckily, the majority of the collection analyzed in the present study were composed of mammals and thus these age designation methods were applied.

Age groups were assigned to each of the individuals designated as infant, juvenile, infant/juvenile, juvenile/adult, young adult, adult, senior, and indeterminate. If more specific identifications were possible, they were noted (e.g. 18 months of age). Of course what constitutes any one of these age groups varied by species dependent on the life cycle of the organism and is presented at a species-level below.

Identifying the sex of the individual can be extremely challenging, particularly if they were young. This is because it is reliant on sexual dimorphism and young animals have not reached their full body mass. Due to the apparent abundance of young animals in this collection, the majority of the fauna remained sexually indistinguishable. Again, species specific methods of determining sex varied widely, and is discussed in further detail below.

Element Distribution and MNI

While many of the individuals were interred complete, some were prepared as pelts or as other ornaments (e.g. mandibular necklaces). Mapping out the element distribution of the faunal artifacts can pinpoint which body parts were present, how they were prepared, and can identify the presence of differential preservation. Furthermore, such visual approaches to element distribution calculate more accurate MNI counts (Marean, et al. 2001). This is particularly useful in situations where the faunal remains were extremely fragmented, making it impossible to record more than the mere presence of the teeth. Thus templates were used to spatially record the element distribution that, at the same time, recorded the spatial ordering of other surface features.

Marean and colleagues (2001) have devised a system that records bone fragments on a spatial database (ArcView) to overcome some of the biases inherit in a non-visual approach. For example, the fraction summation approach where fractions of diagnostic zones are recorded into a database (Klein and Cruz-Uribe 1984). Such approaches are subject to differential survivability, inter-analysis variability in zone designations, disenables a correlation to the completeness of bone, and lacks compatibility with other spatial information such as the presence and location of surface modifications (Marean, et al. 2001). Instead, the visual approach investigates the spatial overlap of fragments, accounting for all identifiable fragments whether they present defined zones or not (Bunn, et al. 1988; Marean, et al. 2001).

Once the program is set up, it automates the calculation of the number of pieces that overlap and easily records large samples into a spatial database linked to other surface features. However, this program is highly time-consuming to set up, particularly as the program runs on an old version of ArcView, and would require re-inventing the templates for every new taxa. Thus, Albert Fischer provides

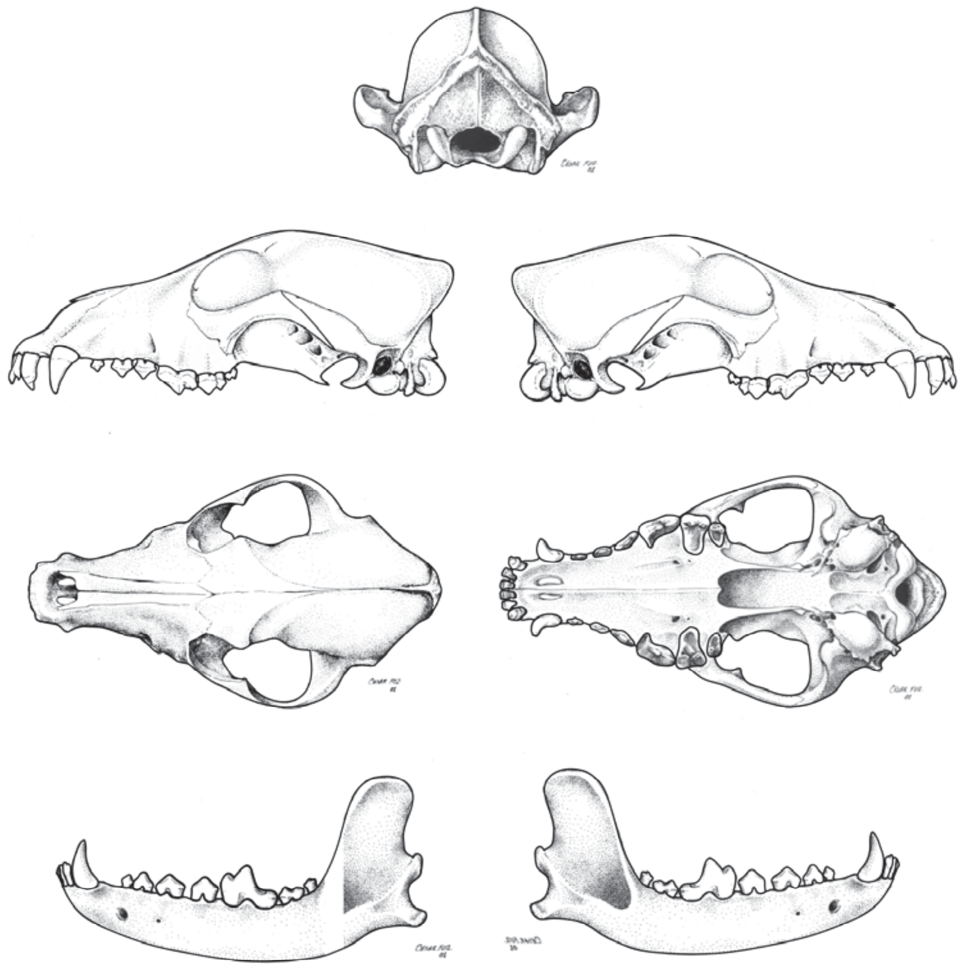


Figure 4.1 Template of canid skull and mandible used for overlap analysis. Compiled from Blanco et al.2009:Figures 1, 2, 3, 4.

a less time intensive method utilizing PaintShop Pro to conduct similar visual quantification analysis (Fischer 2007). While this approach is more manually managed (and thus less feasible for extensive collections) and unable to link up to external databases in the way a GIS program allows, in the present case where animals are fairly complete and the samples are fairly manageable, this alternative method was deemed sufficient for the proposed goals. Thus I have devised a similar template to Fischer's in Adobe Illustrator utilizing hand drawings as templates (Figure 4.1).

For each animal key elements were drawn onto templates with multiple views. Templates of the entire skeleton was also drawn to analyze element distribution of semi-complete animals to look at which body parts were missing, either intentionally discarded during preparation or because they were badly preserved or not recovered in the excavations. Such analytical methods were useful in defining several characteristics in body-part representation. For example, many of the prepared cranial elements were often only represented by the facial portion (snout), suggesting a preference for preparation strategies that discarded the neurocranium.

Complications in calculating the MNI arose in contexts where multiple individuals were combined to create composite artifacts, accentuated by the deteriorated state of the materials that did not permit complete reconstructions. In such cases, like Burial 5, groupings of crushed bones were identified as a unit, assigned an Elemento number, and during laboratory analysis pieces of teeth were often the only elements re-constructible. During this analysis it was determined that many of these groupings included teeth from multiple individuals and MNI was derived from overlap analysis of teeth. Below I explain how such spatial overlap analysis of surface modifications complement the present discussion of element distribution to recreate the production sequence of ritual paraphernalia at Teotihuacan.

Surface Modification

Cultural and natural modifications can reflect taphonomic processes, butchery patterns, procurement strategies, management techniques, health, function and use of the fauna analyzed. These are reflected by the presence/absence, quantity and location of cut marks, weathering patterns, discoloration, gastric etching, carnivore or rodent tooth marks, fragmentation data, and pathologies. Surface modifications reflect distinct aspects in reconstructing the life history of the animal while the presence/absence, abundance and location of these markers can lead to additional insight into post-mortem manipulation and taphonomical processes. Here I highlight some of the cultural and natural modifications observed in this collection to illustrate how these modifications were identified, coded and what sorts of interpretations can be derived.

Taphonomic Indicators

Taphonomical processes recreate the transition of the living animal from the biosphere to the lithosphere (Gifford 1981; Lyman 1994). This includes pre-depositional processes — such as disarticulation/butchery, modification/production of faunal artifacts, use life of an artifact, cooking, consumption (including its movement through the digestive track), and re-use of the bone elements — and post-depositional processes — including weathering, erosion, abrasion, trampling, re-burial, root etching, carnivore or rodent gnawing, and diagenetic processes (Lyman 1994). These processes can be recreated by carefully recording the distribution, degree and quantity for surface modifications such as weathering patterns, bone polishing, thinning, discolorations, burning and tool marks (cut marks, percussion marks, chop marks, and perforations) (Gifford 1981; Reitz and Wing 2004; Shipman 1981).

Extremely varied burial conditions lead to different taphonomical processes. Preservation was affected by different characteristics of the fill material; most importantly, how the fill mitigated pressure on the bones and how water was filtered. One disastrous example is the way large boulders placed in Burial 5 resulted in very fragile and brittle bones with a cracked and flaky bone surface. Traditionally, longitudinal lines with cracking reflect weathering stages used to assess periods of bone surface exposure prior to burial and the time period over which bones accumulated (Behrensmeyer 1978). Despite the close resemblance of the surface patterns to weathering, all the materials including even complete sacrificed animals consistently displayed this feature, suggesting an alternate interpretation. The large boulders probably deformed and crushed the bones while the spaces between these boulders resulted in uneven water leaching through the offering that led to the type of surface texture. In comparison, Burial 2 despite it being older, was filled with compounded dirt layers mixed with fine tepetate fragments causing a more uniform and gradual movement of water and even distribution of pressure on the bones that resulted in better preservation.

Varying degrees of corrosion, porosity, polishing, thinning and pitting characteristics of the damage cause by the digestive enzymes were also recorded (Hockett 1996; Schmitt and Juell 1994). Luckily, the contextual data clearly demonstrated that some of the small game were from the ribcage, reaffirming these modifications were caused by gastro-intestinal processes affecting the bones. Initially, the polished surfaces were identified as possible evidence for boiling/processing of the bones, but it is more likely that it was the result of gastric processes mentioned above. However, some of the elements demonstrate discoloration that we interpret as the result of burning, not discoloration due to digestion. These samples were still within the stomach where digestion was still incomplete. The possibility of discoloration caused by post-depositional processes such as partial bone exposure in the pellet (Schmitt and Juell 1994:253) were thus not an issue in the present concealed context.

Tool marks (cut marks, perforations, chop marks, and polishing)

Quantity and distribution of tool marks indicate capture/kill strategies, butchery practices, pelt extraction methods, and artifact production procedures. Defining differences in butchery and modification patterns (cut mark, perforation, percussion, carnivore tooth mark, rodent gnawing, etc.) were based on experimental assemblages described in the literature (Blumenschine, et al. 1996; Fisher 1995; Shipman 1981). Analyzing the distribution and frequency of cut marks have been argued to reflex different aspects of the butchery process (Lyman 1987). This includes the function of the carcass (subsistence), when the meat was accessed (primary/secondary), reflect skinning strategies, utilized as identity markers and evidence for specialization (Binford 1981; Bunn and Kroll 1986; Reitz and Wing 2004; Shipman 1981; Yellen 1991). For such interpretations it is important to record degree of redundancy and purposiveness inherit in the distribution of these marks (Lyman 1987). In the present case we know the animals were manipulated to create ritual paraphernalia. Therefore, the analysis of tool marks is conducted to reconstruct the ritualized production process of these highly specialized artifacts. In such an analysis, it becomes more important to be able to analyze the degree of standardization between species, look for diachronic changes in production procedures, identify discernible styles of production and look for indications where and who produced these relics.

Traditionally, there have been two frameworks for recording and quantifying cut marks that is conducted through either counting and describing the marks onto a database, or drawing the marks onto a diagram/template. Abe and colleagues (2002) critique the disparity between the two types of analysis and propose a more spatial and quantifiable approach by recording the distribution of these modifications coupled with the element distribution utilizing a GIS based spatially oriented quantification program described above (Marean, et al. 2001). Such an approach is useful in cases where the degree of fragmentation and differential preservation can strongly influence calculations of the proportion of the assemblage with tool marks (Abe, et al. 2002). As described above, the present study created templates in Adobe Illustrator to overlay spatial and quantifiable data that is less time consuming and still provides the advantage of quantifying the results in a spatially oriented paradigm.

Such an approach, combining element distribution with cut mark analysis has been successful in identifying specific types of preparation procedures such as taxidermy among eagles. It has also helped reconstruct the production sequence of the canid/felid cranial elements. These results have led to an even more detailed examination with the Scanning Electron Microscope (SEM) to reconstruct what implements were used to create bone products. While the results will not be discussed in this dissertation as the analysis is still in progress, already this method has proven to be effective. Certainly, extensive experimental studies of shell manufacture utilizing diverse implements were fruitful in recreating what specific tools were utilized in its production (Velázquez Castro 2007; 2010). Needless to say, part of reconstructing the ritualized production process of the highly symbolic faunal artifacts distributed in these burials requires a very vigorous methodology that accurately records the spatial distribution and quantification of these surface modifications in the manner described above.

Pathologies

Natural (old age, disease) and cultural (management strategies) processes that have affected the animal are reflected on the bones (Baker and Brothwell 1980). Such osteological indicators can help reconstruct the health, diet, environmental conditions, capture/hunting strategies, and even human-animal interactions that took place. Pathologies such as the overcrowding or abnormal wear on teeth, resorption, lesions, pitting, evidence for enamel hyperplasia, and high injury rates may indicate stresses caused by being in an artificial environment and often have implications for changes in animal management practices (Baker and Brothwell 1980; Davies, et al. 2005; Rogers and Waldron 1995; Serjeantson 2009).

In the PPL and PPS collection several injuries or abnormal dental and cranial characteristics were recorded into the database and drawn onto templates that illustrate their exact location (Chapter 5). Such a recording strategy, which contains not just the distribution of pathologies, but also other surface modifications and the element distribution for each individual, helps characterize the life history of the animals in more detail.

Previous zooarchaeological research at Teotihuacan

Most of the zooarchaeological research conducted in Teotihuacan have focused on subsistence strategies in residential complexes. While this is not the focus of the present study, the overall synthesis of the reports demonstrates that the species recovered from excavations at the Moon Pyramid and Sun Pyramid are distinct from residential contexts. Abundant small to medium sized game such as rabbits/hares (24%), dogs (11%), deer (11%), mixed with abundant avian species such as the domesticated turkey (6%) and waterfowl (4%) that were locally available were found in these domestic assemblages (Figure 4.2, Appendix A)(Rodríguez Galicia 2006; Starbuck 1987; Sugiyama, et al. 2014; Valadez Azúa 1992; 1993). Recent studies have further identified the use of imported faunal resources, such as marine fish (Rodríguez Galicia 2010; Rodríguez Galicia and Valadez Azúa 2013).

The very high percentages of rabbits and hares are of particular interest, as there is possible evidence that the Teotihuacanos were raising rabbits at the Oztoyohualco apartment compound (Valadez Azúa 1993). The overall consumption patterns at Teotihuacan support the hypothesis that household-level production of rabbits/hares supplemented domesticated animals and wild game (Somerville, et al. 2014; Sugiyama, et al. 2014). Waterfowl were kept in domestic spaces during the colonial period (Pohl and Feldman 1982; Valadez Azúa 2003) and it is likely that this was also practiced at Teotihuacan. At the same time, the Teotihuacanos were still subsiding on a varied diet that included a diversity of local and foreign wild fauna represented at the site. In the apartment compound of Teopancazco alone, whose debris was fine screened, there were around 80 genus/species identified that included a truly diverse array of fauna not recorded previously at this site (Rodríguez Galicia 2006; 2010; Rodríguez Galicia and Valadez Azúa 2013). Particularly impressive was the avian and ictiofauna diversity, which included 24 genus/species of birds and 17 fish genus/species (Appendix A).

Up to 24 genus/species of non-local vertebrate fauna were identified at Teotihuacan. The foreign mammals included the jaguar (minimum number of individuals-MNI=9), jaguarondi (MNI=1), lynx

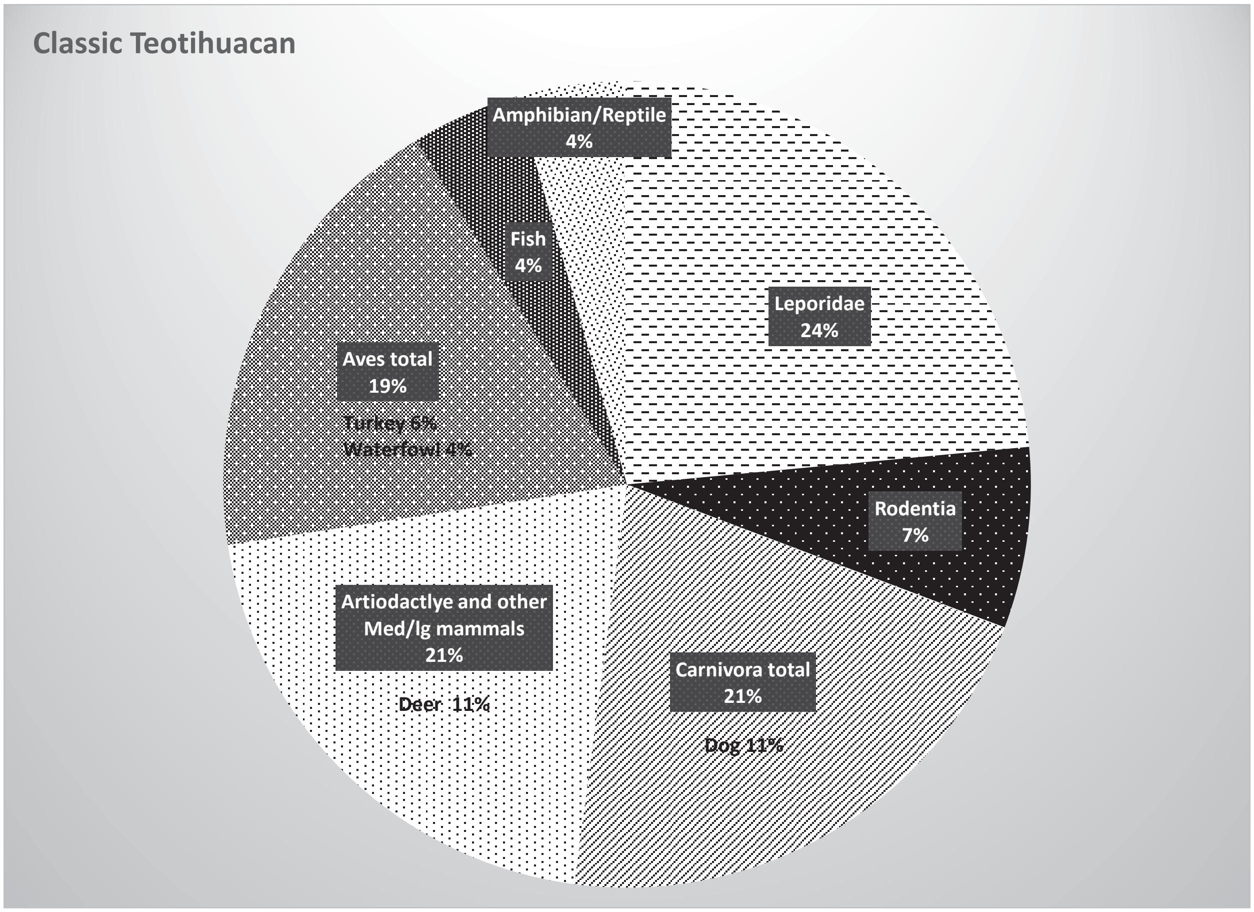


Figure 4.2 Percent MNI of faunal resources from published reports from Classic Teotihuacan sites.

(MNI=1), bear (MNI=1) and spider monkey (MNI=2). Avian foreign fauna consisted of darters (MNI=1), white ibis (MNI=1), and ring-billed gull (MNI=1). Non-local reptilian species like the wood turtle (MNI=1) and the crocodile (MNI=1) were also present. At the Teopancazco apartment compound a series of marine fauna were identified including the pencil urchin (MNI=1), two types of crabs (MNI=3), and 16 types of marine fish (MNI=79) (Rodríguez Galicia and Valadez Azúa 2013).

Only very minimal information is available about fauna recovered from the ceremonial center because such discoveries were rare and not always well recorded. One exception was a short report sent to the project directors of Proyecto Templo de Quetzalcoatl (PTQ) by Alvarez and Ocaña (1993) of the initial bulk sort that provided some fauna counts of the materials recovered from the Feathered Serpent Pyramid (FSP). While the contextual information of many of these identified elements (total 28) were unclear, it showed that FSP fauna included some of the same species found in the Moon Pyramid and Sun

Pyramid, but in smaller quantities (Appendix A). Needless to say, the absence of zooarchaeological correlates outside of the interior of the monuments of these highly symbolic animals go in accordance with the restrictive access the Teotihuacan state had of these animals.

Felids (Felidae)

Before diving into the rich zooarchaeological dataset discussed in the subsequent chapter, each of the main actors need to be introduced. Characterizing each species helps interpret why these actors were chosen to participate in the ritual spectacle and how these animals were conceptualized. This background is necessary to understand why and how the Teotihuacanos physically and symbolically interacted with these animals. For each of the actors, I discuss which species were utilized, the ecology/biology/behavior of the animal, how age, sex and species were assigned, and the presence or absence of these species in other contexts.

Ecology, biology and behavior

Several species of felids are found in Mexico –the jaguar (*Panthera onca*), the puma (*Puma concolor*), the jaguarondi (*Felis yogouaroundi*), the margay (*Felis wiedii*), the bobcat (*Lynx rufus*), and the ocelot (*Felis pardalis*). Only the jaguar and puma have been identified in the present context, and are the only species discussed throughout the dissertation. However, many of the native classificatory systems distinguished between other felids and the two largest cats (the puma and the jaguar) that have always maintained a very special role as one of the most prominent carnivores throughout the New World. As mentioned in Chapter 2, many of these classificatory systems were based on the physical characteristics of the animal in question, often symbolizing aspects of their phenotypic features, behavioral traits and the environmental associations. These attributes further define how humans would have interacted with the animal (prey/predator distinctions), their visibility, and how they were integrated into native ethnozoological classification. Thus I begin by describing the ecology, biology and behavior of each of the main actors of this ritual spectacle.

The jaguar inhabit a range of habitats including jungles, rain forests, wet grasslands, dry scrub lands, woodlands, swampy savanna marshlands, marshlands and even desert areas and are closely

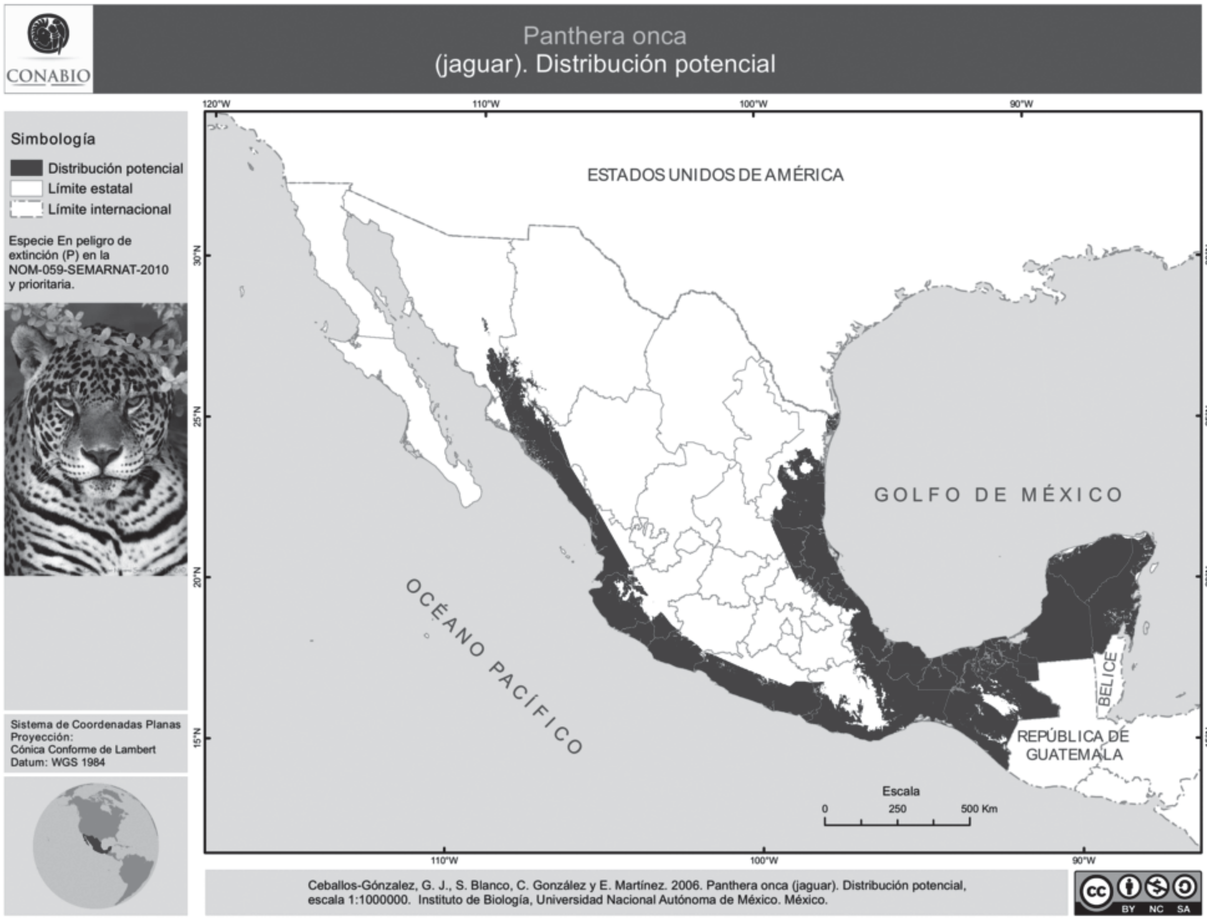


Figure 4.3 Potential distribution of jaguar (*Panthera onca*) (Ceballos-Gónzales, et al. 2006) © CONABIO.

associated with bodies of water near rivers, streams, and lakes (Rosa and Nocke 2000:26-27; Seymour 1989). They are mainly found in the tropical lowland region and are not local to the Central Mexican highlands. However, their ranges extend along the Sierra Madre Occidental and some jaguar sub-species (*Felis onca arizonensis*) have been identified extending into Northern Mexico (Chihuahua and Sonora) and some have even been reported in southwestern United States (Nogales, Arizona) (Hall 1981:1037) (Figure 4.3). While this demonstrates that any live jaguar, or even their prepared cranial elements identified in the burial chambers, were imported into the city of Teotihuacan, they were not necessarily brought in from the tropical lowlands. In contrast, the puma occupy the largest range of habitats than any other feline species in the Americas extending widely from North America to South America (Currier 1983; Rosa and Nocke 2000) and would have certainly been available in the Teotihuacan Valley.

As these two predators overlap in home ranges, they are in direct competition and it is necessary to understand the sympatric relationships between these two species (Monroy-Vilchis, et al. 2009; Núñez, et al. 2000). As hyper-specialized carnivores, prey availability would have affected both jaguar and puma populations in any given region. Jaguars enjoy diverse foods, usually diurnal terrestrial mammals over 1 kg body mass are their chief prey (e.g. peccaries, capybaras, pacas, agoutis, armadillos, caimans and turtles) (Seymour 1989:4). The puma, on the other hand, are opportunistic hunters that prefer deer that contribute up to 50-90 percent of their diet, which is not a main food source for jaguars (Currier 1983; Leopold 1972:480).

Jaguars are the largest and strongest feline (1.57-2.19 m for females, 1.72-2.41 m for males) in the Americas which allows them to kill and move prey heavier and larger than itself (Rosa and Nocke 2000; Seymour 1989). Jaguars have a unique coat marked with black rosettes over an orange yellow or tan background (some are completely black) that phenotypically distinguishes the jaguar quite drastically from the puma (Rosa and Nocke 2000:25). They are mainly nocturnal, most commonly associated with the night sky and conduct the majority of their hunting at night (Leopold 1972:266-267). Male and female jaguars roar day and night that can be heard for several hundred meters (Emmons and Feer 1997; Reid 1997:275), making them visible to humans. Pumas, the second largest mammalian carnivore in Mesoamerica, are distinct from the jaguar due to its cinnamon or reddish brown coat with white under-parts (Rosa and Nocke 2000:36). Although they are also active day and night, they are shy and seldom seen or heard (Leopold 1972; Reitz and Wing 2004).

Jaguar cub birth patterns vary by location and circumstance (in captivity recorded year round), but in Mexico are usually reported from July to September with litters ranging between one and four cubs (Seymour 1989:3). They reach sexual maturity by two to three years among females and between three to four years for males (Rabinowitz and Nottingham 1986; Seymour 1989). They may continue to suckle for five to six months, staying with the mother for about one and a half to two years before becoming solitary (de la Rosa 2000:32). In the wild they usually live from seven to twelve years, but have been documented to live up to 27 years (Seymour 1989). In youth, jaguar pelage is heavily marked with black spherical spots that may contain pale-colored centers.

Most puma births take place between April and September, although they can occur year round, with litter sizes ranging from one to six cubs (average of two) spaced every two to three years (Currier 1983:3; Young and Goldman 1946). At birth, puma cubs weigh around eight to twelve ounces, measuring from eight to twelve inches long, and their eyes and ears remain closed for one to two weeks (Young and Goldman 1946:115). Puma cubs wean for four to five weeks or longer (Young and Goldman 1946). Cub coats differ from adults as they are spotted, which gradually fade starting at 12 to 14 weeks and are only discernible by the time they reach one year of age. The young usually travel with its mother for one and a half to two years. Between two to three years of age the puma reach sexual maturity and full body size is attained between two to four years (Currier 1983). In the wild, puma are considered old if they reach 12 years of age, but in captivity they are known to live over 20 years (Currier 1983).

Both pumas and jaguars are solitary animals, only coming together for copulation. The female take care of her kittens for about two years. They are highly territorial, with male ranges seldom overlapping, while females usually co-habit male ranges in more concentrated distributions. Home ranges vary significantly between jaguars and puma, but also within a species based on seasonality, environment, prey availability and intrinsic factors of the animals themselves (age, sex, body size, etc.) (Grigione, et al. 2002; Seidensticker, et al. 1973). Overall, they range between lower estimates of jaguars ranging from 25-38 km^2 for females and 50-76 km^2 for males (Rabinowitz and Nottingham 1986), to upper estimates of pumas calculated to extend between 723 km^2 (male) to 541 km^2 (Grigione, et al. 2002). This would have made felid acquisition difficult task, as the quantity of felids in the burials were most likely predetermined number based on its symbolism. This would have required maintaining cubs from disparate home ranges to secure the necessary number of individuals for use in the ritual spectacle.

Species, age and sex determinations

Distinguishing between different species of felids is quite challenging, especially when dealing with young. Many cite the body size differences as a useful parameter, but body size overlap quite significantly, particularly among immature individuals. Jaguars usually measure 1-1.6m from head to body weighing 45-114kg while pumas range between 1-1.4m weighing 27-73kg (Leopold 1972:464-476). While Isidro Luna (2007) has painstakingly examined cranial metric differences confirming that jaguars are statistically larger than pumas, she also recorded the large degree of variation among the subspecies of jaguars. Because of the large number of infant and juvenile specimens in the present collection, body size alone was not a solid indicator of the species. Thus a mixture of morphometric characteristics, particularly examining cranial, dental and hand and foot bones would be most ideal for species level designations (Isidro Luna 2007; Montserrat Morales-Mejía, et al. 2010). While Hillson (2005:58) mentions dental features between *Panthera* and *Felis* are practically indistinguishable in overall form, as they are best preserved in the archaeological record (sometimes the only elements that can be re-pieced), they were carefully examined for inter-species differences. For example jaguar canines have been reported to be overall wider and some lower molars may contain an extra metaconid cusp (Hillson 2005:279). Montserrat Morales-Mejía and colleagues (2010) have further examined distinct metapodial and phalangeal elements to determine that overall jaguar elements tend to have accentuated muscle insertions.

In addition to these published criteria for species distinctions, I was able to examine the felid collection housed in the Biological Institute at the UNAM to look specifically at geographic variability. Unfortunately, young puma and jaguar collections were non-existent, and species differences among young individuals has not be verified. Thus future work on determining species differences among young are necessary. Many of the individuals, indeed, were left as unidentified felid due to these constraints.

Several features were examined to determine the age and sex of the felid. Dental sequences are the most accurate way to determine the age of young individuals as tooth eruption sequences are fairly consistent. Puma deciduous teeth (starting with the incisors), begin to appear from 10-20 days, obtaining a complete set by 50 days after its birth. Table 4.1 illustrates the tooth eruption patterns for puma. No specimens less than 12 months have canines with closed apical foramen (Kvam 1984), and hence can be distinguished from felids with full dentition and over one year old. Teeth reach full size by ca. two years of age and shows little variance in measurements after this age (Gay and Best 1996:196). Therefore,

Table 4.1 Tooth eruption sequence for *Puma concolor*, data from Currier 1983.

Age	Tooth eruption
10-20 days	Primary incisor teeth first appear
20-30 days	Canines first appear
30-50 days	Premolars appear
5 ½ months	Permanent incisors start replacing primary teeth
8 months	Permanent canines appear, and for a short time both permanent and primary canines are present. However, Kvam (1984) says permanent canines erupt after 4 months.

Table 4.2 Description of tooth wear patterns for *Puma concolor,* from Gay and Best 1996:192-194.

Age	Males	Females
2 years	Canines white with no stain no wear on incisors or canines.	Canines white with no stain, spot of wear on highest cusp of I^3, no wear on I^1, and I^2, tips of canines with slight wear.
3-4 years	Canines lightly stained, spot of wear on highest cusp of I^3, I^1, and I^2 with little or no wear, tips of canines with slight wear.	Canines lightly stained, I^3 worn flat (3-4 mm) along crest. I^1 and I^2 with slight wear along entire crest, tips of canines with obvious wear (2mm off).
5-6 years	Canines moderately stained, I^3 worn to within 3-4mm of crest of I^1 and I^2, tips of canines with obvious wear (3mm worn off).	Canines moderately stained. I^3 worn to within 1-2mm of crest of I^1 and I^2, tips of canines flat with 3-5mm worn off.
7-9 years	Canines darkly stained, I^3 worn nearly to level with I^1 and I^2, tips of canines flattened to slightly rounded.	Canines darkly stained, I^3 worn level with I^1 and I^2, tips of canines worn rounded.
≥10 years	All incisors worn to or nearly to gum line, canines worn rounded to blunt.	Incisors worn to or nearly to gum line. Canines worn blunt.

further evaluation of tooth wear patterns for older individuals is necessary following Gay and Best (1996:Figure 2)(Table 4.2). However, there are many problems with identifying the age of an individual from teeth wear patterns alone (Stander 1997). Further complications arise in the Teotihuacan case where some individuals display abnormal teeth wear patterns due to unnatural conditions. Hence teeth wear analysis must be supplemented by other methods of age determination.

Jaguars sprout a full set of deciduous teeth by 36 days or so, but don't begin to eat meat until 10 to 11 weeks after birth (Rabinowitz and Nottingham 1986). Lower deciduous incisors erupt at around 9 to

19 days, the upper at 11 to 23 days, the upper canines around 30 days, and the lower canines at 36 to 37 days (Stehlik 1971). Permanent dentition eruption patterns are fairly consistent with other felids, ordered P2, M1, P4, P3 on the upper teeth and m1, p4, p3 on mandibular dentition (Slaughter, et al. 1974).

Felids tend to have marked sexual dimorphism that can be measured in the canine teeth length ($p<0.01$) (see for example, Stander 1997:159 for Leopards) and pumas and jaguars similarly show a high percentage of sexual dimorphism in the upper canine anteropsterior diameter (pumas 14%, jaguars 12%) and the upper canine mediolateral diameter (pumas 9%, jaguars 11%) (Valkenburgh and Sacco 2002). Other differences between the sexes include: the extent of tooth deterioration (females show similar discoloration to the males, but are less prone to flaking of enamel layers and breakage) (Stander 1997) and the form of some of the cranial bones, such as the frontal-temporal suture (Hall 1981:Figure 576).

Puma juveniles less than a year old have smooth and round cranium, with a braincase that is large in comparison to the facial parts of the cranium and mandible. There are only faint suggestions of the postorbital processes and the sagittal crest that later become prominent structures. Significant growth continues during most of the adult life of a puma (females from five to six years, males seven to nine years) (Gay and Best 1996:196).

For about the first 30 weeks male and female pumas weigh about the same and individual variation is greater until adult weight is attained between the ages of two to four years (Currier 1983:3). Gay and Best (1996) was able to examine 19 morphological characteristics that illustrated significant sexual dimorphism ($p<0.001$, $n=1201$). Of these characteristics, the greatest diameter of the upper canine and the greatest diameter of the lower canine illustrated the greatest variance. However, it is also apparent that there is considerable geographic variation in the degree of sexual dimorphism (Gay and Best 1996).

Zooarchaeological evidence

There were only scant evidence of felid bones identified in previous zooarchaeological studies, suggesting that the use of pumas and jaguars was restricted. Only one puma element was identified at Teopancazco and three individuals were excavated at the FSP represented by one deciduous tooth, one semi-complete individual, and one head (Álvarez and Ocaña 1991; Rodríguez Galicia 2006). The lack of puma skeletal elements in the zooarchaeological dataset at Teotihuacan is staggering, considering it was locally available and was prominently depicted in the iconography. Jaguars, being a non-local species, is fairly obsolete within the faunal record with only one canine identified at the Oztoyohualco apartment compound (Valadez Azúa 1992). Other felid species were equally restricted; only one element of a jaguarondi (*Felis yagouaroundi*) and lynx (*Linx rufus*) were found in Xocotitla and Teopancazco respectively (Rodríguez Galicia 2006; Starbuck 1975). These two species are exotic, the jaguarondi distributed further south and along tropical and coastal areas, while the lynx inhabits more arid regions in northern Mexico (Leopold 1972).

Felid symbolism in Mesoamerica

Ample iconographic, ethnographic and zooarchaeological data demonstrate both puma and jaguars, but particularly jaguars, were regarded as highly prominent, powerful and prestigious figures that were associated with elites, shaman, warriors, and rulers throughout Mesoamerica (see Benson 1972; Saunders 1984; 1989). While there is not enough space to discuss in detail all ethnographic and iconographic examples of felid use, here I highlight some key attributes and present felid iconography from Teotihuacan to understand its symbolism.

Feline representations dominate the iconographic record throughout Mesoamerica. In particular, the jaguar was conceived as the lord of the animals who was "cautious, wise and proud" (Sahagún 1963:1), and were believed to be the highest order of *nagual* (Gossen 1975:452). They were a symbol of strength, fierceness and valor that was rendered in depictions of jaguars attacking human figures (Aguilera 1985:15-17). They have a long history in the iconographic repertoire, particularly well known in early Olmec art where felids were depicted as were-jaguar babies, an iconographic tradition that expanded even into the highland region (Coe 1972; González Torres 2001; Grove 1972). Jaguars are associated with the underworld and nighttime because they have light-gathering cells (tapetum lucidum) that allows felids to see in the dark and reflects light like a mirror, which is why felids are associated with mirrors (e.g. the Aztec god Tezcatlipoca, smoking mirror, had jaguar attributes) (Saunders 1989; 1990). A jaguar skull from Kaminaljuyu bearing the gold pyrites as its eyes probably reference this aspect of felid vision (Miller and Taube 1993:102).

As highly symbolic animals, jaguar body parts, especially the skin, canines, paws and ears were extensively used to draw affinity with this powerful beast. Throughout Mesoamerica shaman, priests, rulers and warriors are dressed in jaguar accoutrements. For example, Aztec military clans composed of the bravest warriors, *quauhtli-ocelot* (eagle-jaguar) would set off to war dressed in elaborate jaguar and eagle regalia (Saunders 1994:108; Seler 2004:33). Ethnographic accounts document how young males from Acatlán, Guerrero engage in ceremonial combat wearing elaborate jaguar masks and costumes, spilling their own blood in petition for the rain to insure agricultural success (Saunders 1984; 1989:162).

Archaeologically we know that jaguars and pumas were related to power and rulership. One vivid example is the large dedicatory cache discovered by Altar Q at the Maya center of Copan, Honduras. Altar Q vividly demonstrated the accession of the 16th ruler, Yax Pasah (A.D. 763-810), handed the baton of rulership by the founding king, K'inich Yax K'uk Mo, backed by each of the 15 ancestral kings (Agurcia Fasquelle and Fash 2005; Fash 1991). During a period of political imbalance, deforestation and political decline, an ensemble of sixteen felids, mainly jaguars and pumas, were deposited into this cache as an attempt to regain order and legitimacy (Ballinger and Stomper 2000; Sugiyama and Fash 2009). In the Aztec Templo Mayor, puma and jaguar skeletons were included in elaborate dedicatory caches (Álvarez and Ocaña 1991).

Unsurprisingly, felids are abundantly represented in Teotihuacan, particularly prevalent in elaborate mural paintings and stone sculptures at the ceremonial core and in residential compounds close to this metropolis. Variations in felid iconography exist, ranging from naturalistic rendering of jaguars (in the mural painting of "Animales Mitologicos") (Fuente 2006b:Figure 9) and pumas ("Gran Puma" on

Figure 4.4 Mural painting of Feathered Feline from the De Young Fine Arts Museum of San Francisco (Photographed by N. Sugiyama).

platform 16, mural 2)(Fuente c:Lamina 1), to mythological depictions of feathered felines dressed in military regalia (Paztory 1988:Plate 32) (Figure 4.4). Similar to later illustrations at Tula, felids were often associated with heart sacrifices, as some mural paintings from Teotihuacan demonstrate a tri-lobed motif interpreted to represent a heart in front of the felid. Felid iconography was prevalent in other media such as felid stone sculptures found in front of the Sun Pyramid and the Xalla compound located to the north of the Sun Pyramid (Manzanilla Naim and López Luján 2001).

In this manner pumas and jaguars were associated with power, militarism, and domination, linked to the pinnacle of the animal hierarchy as the master of animals. The puma, with its golden coat would have been associated with the sun while the black rosettes of the jaguar and its nocturnal lifestyle would have linked this carnivore to the underworld. These animals were traditional sources of power throughout

Mesoamerica. They continued to serve as principle icons at Teotihuacan elaborately decorating public and private spaces, along the Avenue of the Dead, next to major monuments, and in the apartment compounds.

Canids (*Canis* sp.)

Ecology, biology and behavior

Three canid species were present: wolves (*Canis lupus*), coyotes (*Canis latrans*) and possible hybrids between wolves and dogs (*Canis lupus-familiaris*). While dogs were most abundant in other contexts, utilized as a subsistence source or sometimes accompanying burials, they were completely absent from state-level ritualized contexts. This suggests that dogs, while playing a very prominent role in domestic-level ritualized activities, were not regarded as key actors associated with state spectacles. This was probably due to the clear distinction between wild and domestic forms of the canids, with a particular emphasis on wolves. Biological characteristics were examined to explain why wolves were overwhelmingly favored over coyotes in the zooarchaeological record at Teotihuacan. Elsewhere I have utilized this information to argue that many of the canids represented in the mural paintings at Teotihuacan represented wolves instead of coyotes (Sugiyama and Sugiyama 2007).

Historical records demonstrate that the distribution of coyotes and wolves were dramatically altered after the Spanish conquest. The range of the Mexican Grey Wolf (*Canis lupus baileyi*) has recently been extensively reduced to the extent that they are presently on the endangered species list in Mexico. Their original distribution spanned the Sierra Madre and adjoining table land region of Western Mexico through SE Arizona, SW New Mexico, West Texas and south from Sonora and Tamaulipas into Michoacán, the Valley of Mexico and Puebla (Leopold 1972; McBride 1980; Young and Goldman 1944) (Figure 4.5). However, only a few areas continue to sustain wolf populations — in the Sierra Madre Occidental, the arid mountains of western Coahuila and eastern Chihuahua, and San Luis Potosí (Leopold 1972:401). In sharp contrast, coyote populations benefitted with the decline of wolves that were competitors for prey (Hidalgo Mihart, et al. 2004:2027; Leopold 1972:396-397).

The main factor contributing to the decline of wolf population was probably because livestock were prime prey for wolves and became heavily hunted (Leopold 1972). By the time Gamio (1922, Vol

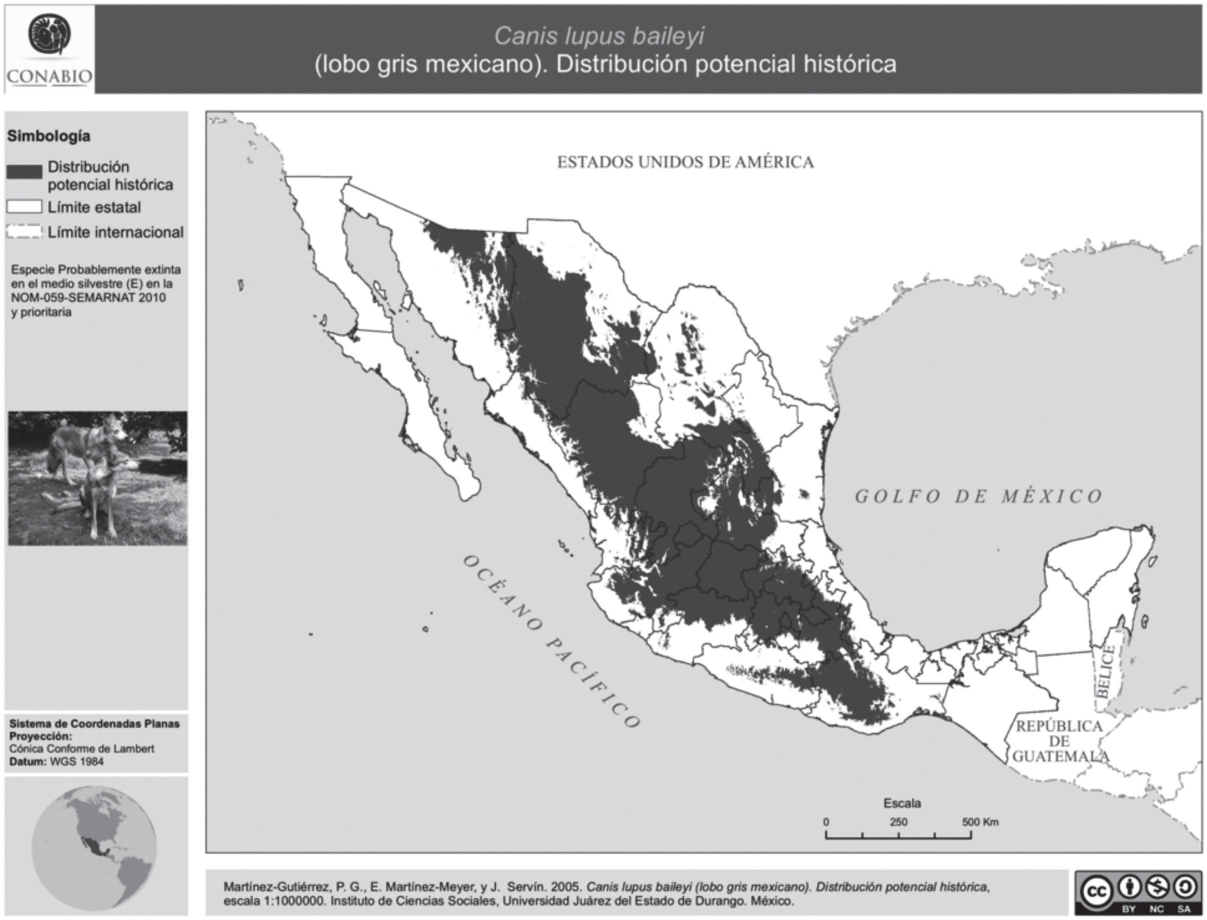


Figure 4.5 Hypothetical historical distribution of Mexican grey wolf (*Canis lupus baileyi*) (Martínez-Gutiérrez, et al. 2005) ©CONABIO.

I:42-49) recorded local species in the Teotihuacan Valley, wolves were no longer recorded. This probably contributed to the biased identification of canids at Teotihuacan, as many investigators were unaware that wolves were present in Pre-Columbian times.

Coyotes are distinct from wolves both by its social organization and prey choice. Coyote social organization is variable, usually living alone or in pairs and sometimes even form larger groups to hunt, but unlike the wolves they never form packs (Gompper 2002:21; Leopold 1972:397). Due to their small size, coyotes often only approach small mammals and young or injured/sick large mammals, and often scavenge the remains of larger wolf killings. While coyotes are often associated with deer killings, coyotes usually only prey on fawns and weakened individuals (Leopold 1972:398). In fact, there are many cases of deer chasing coyotes away. Coyotes are vocal animals that can be heard as they constantly move around the landscape making them highly visible (Leopold 1972:396; Millon 1988:207).

Wolves illustrate a complex social organization, making them appropriate parallels to human groups: they exhibit pair bonding, varying pack sizes that stay together year round, have extended family clans, and have strict leadership hierarchies (Fritts, et al. 2003; Mech and Boitani 2003). Wolves are commonly found hunting in pairs or packs, and adult white-tailed deer are known to be prime prey for wolves. As social carnivores, some have argued that the cooperative hunting style that is not seen by other types of carnivores may have contributed to the close association Huichol communities had with wolves (Fikes 1985).

Differentiating between a coyote and a wolf based on phenotypic characteristics can be especially difficult because the subspecies of *Canis lupus baileyi* found in the Mexican Basin is the smallest gray wolf found in the Americas. Although this subspecies is still larger than the coyote, their coat color is very similar as climate, alimentation, and other extrinsic factors influence coloration and hence is not the best indicator for identification (Young and Goldman 1944:59). However, I have argued elsewhere that there are several characteristics that differentiate the canid representations in mural paintings at Teotihuacan as wolves (Sugiyama and Sugiyama 2007). For example, coyotes are distinguished not only by their smaller build, but also by their pointed, long and forward facing years, with a small slender nose, and delicate feet (Jackson 1951). In comparison, the Mexican grey wolf has rounded ears with a broad and large nose, large and broad paws, with a mane like longer fur along the shoulders and anterior part of the back. While coyotes and wolves may, at first sight seem similar in many aspects, it is apparent that socially they were very distinct and subtle differences highlighting these phenotypic characteristics were emphasized in the mural paintings to differentiate between these two species (Sugiyama and Sugiyama 2007). Such characteristics were probably eminent to indigenous communities and were reflected in their indigenous classification system. In the present case, the Teotihuacanos were choosing the wolf as the most eminent canid to participate in state rituals.

Species, age and sex determinations

Fairly extensive investigation on inter-canid differences has been conducted in Mexico, particularly in distinguishing various breeds of dogs, and differentiating between wolves, coyotes and even how hybrid forms may be identified in the zooarchaeological record (Blanco Padilla, et al. 2009; Rodríguez Galicia 2000; Valadez Azúa, et al. 2006). Particularly, morpho-metric traits in the dentition (especially the carnassial) and the cranium were utilized in the present context.

Like felids, teeth eruption and ware, and bone fusion can help determine age while several metric and non-metric characteristics can aid sexing skeletons (Blanco Padilla, et al. 2009). For example, the shape of the temporal lines in relation to the sagittal crest can help sex a cranium: males have well-developed temporal lines meet just behind the bregma to form the sagittal crest while females, if sagittal crest is present, have temporal lines that meet far behind the bregma (Shigehara, et al. 1997:Figure 5).

Metrically, the cranium showed significant differences as well (Blanco Padilla, et al. 2009). Although cranial proportion does not differ greatly between sexes, all measurements for each maxillary tooth was significant ($P<0.01$); those of males were consistently larger than females. Maximum cranial length differed by approximately 10mm between male and females and males were significantly larger and stronger (Shigehara et al. 1997:115). The mandible also exhibit metric and non-metric characteristics that help identify the sex of the individual. The condyloid crest in the ascending ramus is deeper and with a sharper edge in males than females. Mandibular teeth displayed a significant difference ($P<0.01$) in 19 of the 26 measurements and $p<0.05$ in other six measurements (Shigehara, et al. 1997:119).

Other post-cranial parts that illustrate sexual differentiation are found in the pelvis, where the angle of attachment of the two halves at the pubic symphysis is wider in females (Shigehara et al. 1997). The presence of the *os pinis* bone is a very accurate method to judge that it is a male (Crockford 1997). However, this bone does not conserve well in the archaeological record. As non-metric traits has a high error rate (about 7%), it is necessarily to examine booth metric and non-metric traits to determine sex (Blanco Padilla, et al. 2009; Shigehara, et al. 1997).

Zooarchaeological evidence

Wolf and coyote remains from ritualized activities were found in offerings from the FSP and in cave deposits located to the east of the Sun Pyramid (Proyecto Arqueológico Cuevas Teotihuacanas) (Appendix A). Other zooarchaeological remains were identified at the Xocotitla (Starbuck 1987) and Teopancazco (Rodríguez Galicia 2006) apartment compounds.

Canid bones from the FSP were found in the form of a maxillary pendants that adorned a sacrificed captive from Burial 4. Originally, these maxillae were identified as belonging to six dogs (*Canis familiaris*) by Álvarez and Ocaña (1993), but were later reassigned by Valadez and his colleagues as a compilation of 14 individuals including dogs and several types of hybrids between wolves and dogs (loberro), coyote and dog, and coyote and loberro (Valadez Azúa, et al. 2002a:165). The individuals that were adorned with such canid maxillary pendants were most probably war captives (Sugiyama 2005). Furthermore, a wolf burial composed of a cranium and mandible are recorded from a different burial chamber (Burial 14).

Zooarchaeological remains from four caves located to the east of the Sun Pyramid have been analyzed. Within the cave deposits, most of the canids interpreted to be ritual deposits were identified as dogs (MNI 433 individuals) while hybrids between wolf and dog (MNI 20 individuals) and coyotes (MNI 2 individuals) were only found in small quantities (Rodríguez Galicia 2000; Valadez Azúa, et al. 2002c). Given these finds it seems that coyotes were usually not found associated with archaeological contexts and mostly post-date the Teotihuacan ocupation.

A survey of the faunal remains from residential compounds from various sectors of the city demonstrates that the majority of the canids from apartment compounds were of domestic dogs (Appendix A) (Rodríguez Galicia 2006; Valadez Azúa 1992; 1993). Different canid taxa were used in ritual spaces versus residential units; wolves were abundant in many ritual contexts while domestic dogs were eminent in household rituals and non-ritual contexts. Only scant remains of wild canids have been found from apartment compounds (n=4) suggesting that like the wild felids, their use was restricted.

Again, this scarce evidence is in sharp contrast to the prominent display of canid iconography found in the apartment compounds.

Only three coyotes were recorded from archaeological deposits, suggesting they were intentionally avoided while wolves and dogs were preferentially selected to be used in ritual practices or for alimental purposes. The materials from the burial contexts analyzed in this dissertation further confirm this pattern.

Canid symbolism in Mesoamerica

Both the coyote and the wolf can be found in ethnographic and ethnohistorical sources as prominent figures in mythologies (Blanco Padilla, et al. 2007a; b; Valadez Azúa, et al. 2008). The Nahuas describe the coyote as astute, revengeful, but thankful, and was believed that it expressed sexual desires. Being the patron deity of feather workers (Millon 1988:208) it loved music, dancing and pleasure (Aguilera 1985:18; Sahagún 1963). They were revered as warriors with certain distinctions that achieved high rank in battle (Millon 1988:208). Blanco et al. (2007a), for example, have argued that the title "caballero pardos" was assigned to lower status individuals who were braver warriors that were distinguished by wearing wolf regalia.

There is also a rich repertoire of wolf symbolism among the Huichol Indians that closely resemble descriptions of the coyote from Aztec sources. In fact, they are so closely related that one scholar equates Huichol myths of the wolf with coyote tales of Uto-Aztecan families (Kelley 1955). The Huichol Indians describe the wolf as a trickster, vengeful and carries sexual implications. The transformation into a wolf by a shaman is considered the most emotionally intense and can be reached only by certain shamans that usually follow family lineages. Once a shaman has reached this stage he is able to masters three abilities; hunting of deer, healing, and the control of rain (Fikes 1985:249).

It is believed that wolves taught the Huichol how to hunt deer and the peyote, which is considered to be the heart of the deer. This is why the Huichol sing to the wolves and make offerings to them prior to going hunting (Fikes 1985). This direct association between the wolf (predator) and deer (prey) is expressed at Teotihuacan in the mural painting, "Coyotes and deer", where two canids are painted

Figure 4.6 Mural painting of "Coyote and Deer" from the De Young Fine Arts Museum of San Francisco (Photograph N. Sugiyama).

devouring a deer (Figure 4.6). For the Huichol, wolves are ancestor-deities, call "Elder Brothers" (*matzimama*), and this kinship is represented through marriage and are told to have interbred in the past (Fikes 1985:267-268; Zingg 2004:68-75). Wolves are thus considered custodians of ecological order as they dictate the procurement of three vital sources, rabbit, deer and peyote (Fikes 1985:253). Wolves help the Huichol obtain the necessary deer and rabbit blood to feed the ancestor deities who, in turn, provide them with rain and maize (Fikes 1985).

Utilizing these analogies of wolf and coyote I have argued that the majority of the canid representations at Teotihuacan were probably depicting wolves (Sugiyama and Sugiyama 2007) despite the overwhelming use of the term "coyote" to describe murals (Millon 1988). There is a great degree of variation in the forms in which the canids were drawn, which include canids in profile, in the midst of a hunt or sacrifice, and still others that were drawn as anthropomorphic figures dressed in militaristic attire.

Eagles (*Aquila chrysaetos canadensis)*

Ecology, biology and behavior

Among the many subspecies of golden eagles distributed throughout the world, the *Aquila chrysaetos canadensis* is the only member found in the Nearctic. Distributed from Alaska, Canada, through the western Unites States, and extending all the way into central Mexico, this specie would have been locally available in the Basin of Mexico (Watson 2010:43). These raptors inhabit varied habitats ranging from arid or semi-arid areas, deserts, open grasslands and even farmlands (Howell and Webb 1995:206). They are about 79-91.5 cm tall with wingspans that reach 183-213 cm (Howell and Webb 1995:205). Eagle age span usually range between 20-30 years (Watson 2010:306). Captive eagles have longer life spans, one example recorded to live up to 46 years (Gordon 1955:36).

Their nests are predominantly found along cliffs, escarpments or outcrops and are highly visible on the landscape as they have spectacular undulating display flight (Watson 2010, Herron et al 1985:45). These raptors form semi-permanent pair bonds that maintain a vaguely defined home range with overlapping common hunting grounds (Watson 2010:126-129). Clutches ranging between one to three chicks but usually two chicks hatch most commonly between late April and early May (Ellis 1979:7; Watson 2010). Eaglets undergo an extremely rapid growth from a hatchling weighing around 100g to a fully grown bird weighing three to four kg in 10-12 weeks (Watson 2010:207). During this time, plumage changes drastically as well, beginning with a 'pre-pennae' down for up to 25 days when the eaglet appears whitish, transitioning from 25 to 50 days when dark contour feathers grow that begins to give a dark brown appearance from 50 days forward. Only after the fifth or sixth summer when the eagle completed multiple molts is the full adult plumage, which no longer retains the white color for two-thirds of their length, transforming to a golden color with sharp dark black tips (Watson 2010). Marked loss in weight during feather growth illustrates the large energy expended on this process (Gordon 1955). Nestling period is dependent on various factors (sex, weather conditions, prey availability, parental behavior), but usually ranges between 60 to 80 days (Watson 2010:220).

Their diet consists of varied mammalian and avian prey species (Watson 2010), but one study in Nevada reported leporids (particularly hares) and other small game (squirrels) constituted between 80-96% of the eagle's diet, suggesting an allopathic relationship with leporid distribution (Herron, et al. 1985:46). Eaglets begin to eat on their own after one month in captivity (Steenberg 1981:111). This is usually accomplished by either tearing chunks of meat and bones off of the prey or swallowing whole

(Ellis 1979). Consumption in this manner results in large pellets, like many raptors, that include a mixture of fur/feathers and bony elements. Studies particularly focusing on eagle pellet remains recorded that, contrary to expectations, large, fairly unbroken elements were found with signs of corrosion (scouring, pitting and thinning), polishing, and staining to the bone (Hockett 1996). In this study, only two to four bones were found in each pellet, but they hypothesize that this low count compared to coyote pellets is probably because eagles swallow relatively fewer bones during feeding (Hockett 1996).

Species, age and sex determinations

There has been an extensive comparative study of the differences between golden eagle (*Aquila chrysaetos*) and bold eagle (*Haliaeetus leucocephalus*) skeletals by McKusick (2001) that made the identification of golden eagles fairly straight forward. As bold eagles are not prevalent in the Mexican Basin, there were no samples found to date from Teotihuacan.

The age of live golden eagles are fairly easy to identify based on plumage. Juveniles have darker and more uniform plumage with white patchy undersides while adults have more fresh dark feathers that later fade away (Wheeler and Clark 1995:123-126). However, it is significantly more difficult to assess the age and sex of eagles from solely skeletal elements. This is because many birds do not have epiphyseal growth plates. Instead, avian long bones expand through apposition from the core toward the articular surfaces (Serjeantson 2009:17). Thus only bone porosity and length indicate the presence of infant and juvenile bones. Further difficulties are caused by the speed at which avian skeletons reach skeletal maturity (in eagles by 10 to12 weeks), which occurs well before the bird becomes sexually mature and develops full adult plumage (five to six years) (Serjeantson 2009:35). The young age at which eagles reaches full body size makes it extremely difficult to find immature bones in the archaeological assemblage. However, when they are identified, they can be accurately aged, indicating fairly concrete features of captivity, season of occupation and selection procedures. For example, very young specimens of macaws and turkeys and their egg shell fragments were identified at the site of Paquime in Chihuahua, Mexico (Di Peso, et al. 1974).

McKusick (2001) has been able to distinguish some age stages among golden eagles. Young golden eagles, for example, have an intraoribital fenestra that is quite pronounced the first year that is gradually filled until it disappears around the second or third year in males and as late as into the fourth year among females (McKusick 2001:142, Figure 57). Another age indicator is the fenestra present near the posterior margin of the sternum, but McKusick (2001) did not find any significant patterning to be able to trust this as a diagnostic feature. Overall, the posterior margin of the sternum seems to be relatively smooth by the end of the first year with adults exhibiting a central convexity (McKusick 2001). Unfortunately, these two areas are very thin making them susceptible to breakage and were nearly always absent in the present collection.

It is a much harder to differentiate sex among both live eagles and their osseous remains. Some field guides argue that adult females are larger with wide irregular gray blob that runs across the center of the tail feathers that contrast to smaller males that have three narrow wavy grayish bands on their tails (Wheeler and Clark 1995:123-126), but most biologists only trust morphometric traits. Harmata and Montopoli (2013), for example, utilized head and hallux length to determine sex. Raptors exhibit reverse sexual dimorphism where females are larger. Female golden eagles have wing spans up to 10% longer and weigh as much as 40-50% more than males (Watson 2010:33). Others have concentrated in identifying medullary bone ―calcium that is located in the marrow cavity that is released during eggshell production― to identify some females during reproductive stages (Sejeantson 2009).

The pelvis also provides cues to the sex of the animal because of the reproductive function it has. Female golden eagle synsacrum does not fuse with the ilium throughout its life while among males, it fuses as early as four months of age (McKusick 2001:Figure 67). Despite their smaller body size, male cranium greatest breadth (GB) (Von Den Drisch 1976:105-107) tends to exceed that of females, perhaps because they bring most of the food to the nest (McKusick 2001). Again, these two characteristics are very fragile, often not found complete, and in most cases were not helpful for sex determinations.

A useful characteristic that tends to preserve well in the archaeological record is the tarsometatarsi. Female golden eagles usually have longer and stockier tarsometatarsi with a broad shaft and broad proximal articular head while males exhibit different proportions that tend to be more gracile (McKusick 2001:144). Female metatarsal facets are inclined to be prominent and well defined while males contain narrower metatarsal facets that trail off. This pattern is true for many long bone elements, as males are generally smaller and slender-shafted, making it particularly hard to distinguish among young individuals that may more closely resemble male stature (McKusick 2001). In the present collection, greatest length (GL) and greatest breadth of the proximal end (Bp) (Von Den Drisch 1976:129) were measured for each tarsometatarsi to be compared with McKusick's (2001:Table 9) measurements.

Zooarchaeological evidence

Similar to the other species described above, there was an amazing contrast between the abundance of zooarchaeological remains of eagles from the state sponsored ritual activities and the almost complete lack of faunal remains from other refuse. Only one eagle element was found at the Teopancazco apartment compound and vertebrae of this raptor have also been mentioned from Burial 14 in the FSP. This pattern is consistent with other fauna suggesting there was a very restricted access to this valuable specie despite it being locally attained.

Eagle symbolism in Mesoamerica

Eagles were often associated with the sun as the respective Nahuatl terms for sunrise (*cuauhtlehuanitl*, ascending eagle) and sunset (*cuauhtemoc*, descending eagle) emphasize the flight of this raptor though the sky (Miller and Taube 1993:82-83). The Aztec sun god, *Tonatiuh*, was usually depicted wearing a feather headdress, with red body paint and large rayed solar disk (Miller and Taube 1993:172). The eagle, together with the jaguar, made up one of the two warrior orders *par excellence*, whom would go out into battle wearing eagle regalia (Miller and Taube 1993:183).

Plenty of ethnographic and colonial documentation allude to the practice of raising birds for ritual purposes. This includes archaeological correlates of breeding and raising macaws that were imported from the tropical regions in Paquimé and Cacaxtla (Di Peso, et al. 1974; Somerville, et al. 2010). Macaws, turkeys, hawks and other birds that were valued for their feathers were penned for their feathers and to become sacrificial victims. The remains of these raptors were found in burials, pens, and depicted in the

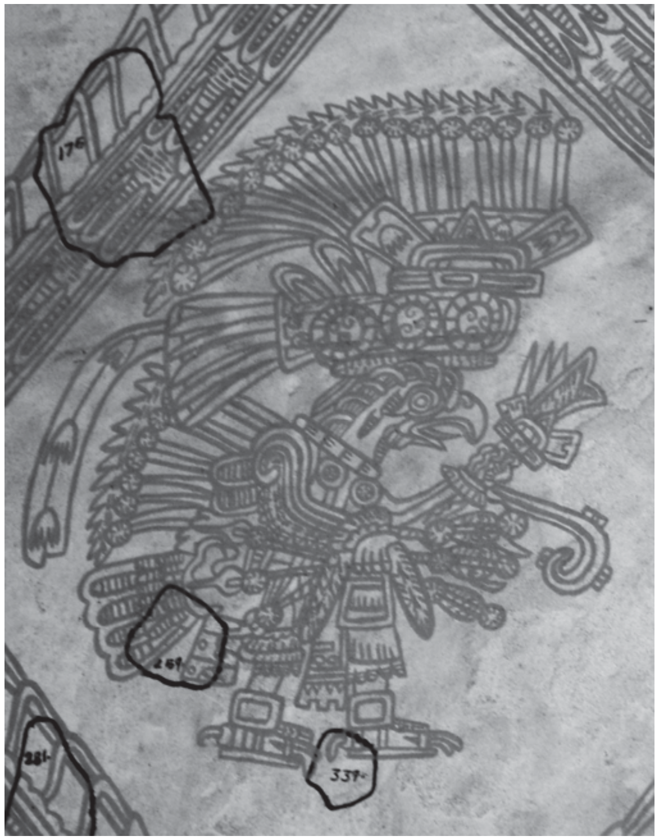


Figure 4.7 Mural painting of a raptor warrior figure from Atetelco, Patio Blanco, Portico 3, Murals 5-7 (Photograph by N. Sugiyama).

ceramic iconography in Southwest United States and northern Mexico (Di Peso, et al. 1974; Hargrave 1970; Hill 2000; McKusick 2001; Szuter 2000). The osteological evidence from Paquime with an array of pathologies including diseases and injuries due to malnutrition, vitamin D deficiency and fractures confirm the presence of an active breeding program at this site (Di Peso, et al. 1974).

Ethnographic accounts demonstrate remarkable consistency in the ritual keeping and sacrifice of birds (turkey, eagle, raven, and macaw) in Southwestern United States (McKusick 2001). Various ethnographic records from modern indigenous groups in the United States (Hopi, Hidatsa) record eagles are caught as chicks, usually by boys, whom feed and raise them, and describe the sacrificial ritual itself (Fewkes 1900; Lévi-Strauss 1966:50; McKusick 2001). These raptors were usually killed via suffocation, its feathers (particularly tail feathers) would be plucked, and depending on the sex, a doll or bows would be placed in front of the raptor to be buried in a designated eagle cemetery (McKusick 2001). One informant mentioned that some families would have up to 17 eagles in captivity (McKusick 2001).

Like the other animals described above, mural paintings from Teotihuacan contain abundant references to prominent avian forms. The apartment compound of Atetelco (Figure 4.7), for example, demonstrates raptors drawn in profile dressed in military regalia. This illustration confirms the link between raptors, probably eagles, and symbols of warfare and militarism.

Other Avian species

Besides the apparent dominant role of the eagle in state-level ritualized activities at Teotihuacan, incomplete specimens of other birds were also incorporated into the burials. Many of the materials found were composed of only partial elements, such as just the extremities, and thus were not primary deposits. Nonetheless, it is apparent they were not mere fill refuse, but were faunal products that were part of the offering. Here I briefly discuss some of these species to complete the picture of the avian assemblage found from offertory contexts.

Great Horned Owl (Bubo virginanus)

Characterized by the thick and busy ears that stick out from the side of the head, the great horned owl (*Bubo virginanus*) is distributed throughout most of Mexico, excluding humid evergreen forests (Howell and Webb 1995:360). They are common throughout northern to central Mexico, becoming less frequent in southern latitudes (Howell and Webb 1995:360). Again, only scant owl remains are found in other contexts with only one specimen identified at Teopancazco (Rodríguez Galicia 2006).

Hawk (Buteo sp.)

Most hawks were red-tailed hawk (*Buteo jamaicensis*), which are large (48.5-58.5 cm; wingspan 118-137 cm) and are abundantly distributed throughout Mexico. It breeds in temperate regions throughout North America to western Panama (Howell and Webb 1995:203-204). The roadside hawk (*Buteo magnirostris*) is smaller (33-40.5 cm; wingspan 68-79cm) and non-local inhabiting the humid open and semi-open countries along eastern and western coasts of Mexico and into the tropical lowlands of Yucatan, Quintana Roo and into areas of Belize and Guatemala (Howell and Webb 1995: 197).

Like other animals Buteo sp., Red-tailed hawk (*Buteo jamaicensis*) and Roadside hawk (*Buteo magnirostris*) were identified only minimally from other contexts. *Buteo* sp. remains were identified in two context at the FSP. Burial 1 contained 12 bone fragments from one individual (no information about which elements) and Burial 4 included remains of vertebrae of this genus (Álvarez and Ocaña 1993). Outside this specialized context, only one red-tailed hawk bone was identified at the Teopancazco apartment compound (Rodríguez 2006). It is important to note here that red-tailed hawks have been recorded to be kept in confinement alongside eagles or to substitute them among indigenous communities in Southwestern United States (McKusick 2001).

Pigeon/Dove (*Columbidae*)

There are many species of pigeons and doves present in Central Mexico, and are very difficult to identify to a species level. While some could only be identified to the family level (Columbidae) three individuals were specified to the level of specie as inca doves (*Columbina inca*). This specie is extremely widespread throughout most of Mexico except Baja California and parts of the tropical lowland zones (Howell and Webb 1995:325).

It is difficult to assess if small species such as the dove could have simply entered the burial fill or was intentionally deposited as they were not drawn in the plan view drawings. The specimens found from burial contexts were composed of either fairly complete individuals or isolated specimens from two burial contexts (Burials 5 and 6). Thus they may have entered the ritual assemblage as offertory artifacts or could have been fed to the carnivores. The Inca dove was also identified in the Teopancazco apartment complex (Rodríguez Galica 2006). The lack of columbidae remains throughout other context is probably merely a result of the large screen size utilized in most excavations. The effect of this is particularly noticeable due to the apparent lack of many micro-animals such as small game, birds and particularly fish in most non-burial contexts; Teopancazco, as it was fine screened, being the exception.

Northern raven (Corvux corax)

Crows and ravens (only distinguished by size) are all-black birds found throughout temperate regions including the Mexican Basin. The northern (or common) raven (*Corvus corax*) is found abundantly in arid to semihumid open and semi open lands (Howell and Webb 1995:547). Their zooarchaeological identification was based on some very detailed work on European species (Tomek and

Bocheński 2000) that was confirmed with modern comparative sample of a general *Corvus* sp. specimen at the Paleozoology laboratory. Two specimens of this animal was recorded from non-pyramidal contexts, one from the Oztoyohualco apartment compound (Valadez Azúa 1992) and another documented at Xocotitla (Starbuck 1987).

Prairie Falcon (Falco mexicanus)

The prairie falcon (*Falco mexicanus*) is a large falcon that inhabits arid to semiarid and open and semi-open habitats (Howell and Webb 1995:219). This falcon breeds in western United States and into northern parts of Mexico, and then migrates into the Basin of Mexico during the winter seasons (Howell and Webb 1995:219). Only one individual was identified as a prairie falcon from burial contexts. One element was identified as *Falco sp*. from the Teopancazco apartment compound (Rodríguez Galicia 2006) and another prairie falcon bone was found during Teotihuacan Mapping Project excavations (Starbuck 1987).

Rattlesnakes

Ecology, biology, and behavior

Some of the rattlesnakes known to inhabit the Mexican Basin include, *Crotalus polystictus* (also known as aquatic rattlesnake), the black tail rattlesnakes (*C. molossus*), Mexican dusky rattlesnake (*C. triseriatus*), Mexican pigmy rattlesnake (*Sistrurus ravus)*, and cross banded mountain rattlesnake (*C. transverses*) (Armstrong and Murphy 1979; Ramírez-Bautista, et al. 2009). They range in habitat preference, some along marshes and rocky or tall grasses, temperate pine-oak forests and mequite grasslands (*C. polysticutus*) while others prefer high elevations along mountain ranges (*C. molossus*). Among the species mentioned above, the *Crotalus triseriatus triseriatus* can inhabit the highest elevation among montane *Crotalus* species, recorded on Mt. Orizaba, Veracruz (4572 m.a.s.l.) (Armstrong and Murphy 1979:56). Many of these rattlesnake are associated with the spring and aquatic symbolism, mainly because they emerge either right before or during the rainy season. Their aggressiveness varies considerably by specie and season. For example the *C. trvansverses* is particularly non offensive

(Armstrong and Murphy 1979:56), while the *C. polystictus* emerge from hibernation relatively inoffensive in the late spring, resuming an aggressive posture only during the summer months.

Species, age and sex determinations

While the primary cranial and mandibular elements are useful in species level identification of snakes, the majority of zooarchaeological assemblages only contain ribs and vertebrae that are more abundant and larger than the thin, unfused cranial elements. Unfortunately ribs are diagnostic only to the Suborder (Serpentes), and thus vertebrae have been the main element used to identify the family and genus in question (Walker 2003).

Crotalus vertebrae were identified based on descriptions in the literature (Auffenberg 1963; LaDuke 1991:22-23). Size varies among species, and closer examination of each is required to identify their range and variation. While such a study is beyond the scope of the present study, careful morpho-metric traits were taken for future designation to a species-level once a more comprehensive comparative collection can be consulted. At this point, 23 metric and seven morphological characteristics were taken for five mid-trunk vertebrae (MTV) and five posterior-trunk vertebrae (PTV) following La Duke's (1991) methodology. In general, at least two different species were represented in the faunal assemblage, distinguished by the vertebrae size and a more elongated haemal process and spinous processes by the larger species.

There is usually a correlation between age and body size among amphibians and reptiles, but this relationship is weak, influenced by many individual variations within species and among age classes to be a sole indicator of age (Halliday and Verrell 1988). Thus such a task is useless when dealing with individuals that have not reached full body length (Klauber 1937:31). One key feature in identifying young rattlesnake is the presence of the prebotton on the rattle that defines the serpent to be only a few days old before it is lost with the first shedding (Klauber 1937:2). Unfortunately, this was not recorded on any of the individuals examined thus far. Skeletochronology of vertebrae, counting the growth layers on the centrum that represent periods of hibernation, are useful, but highly labor intensive that require testing each of the species in question with individuals of known age (Minakami 1979; Waye and Gregory 1998).

Similarly, determining the sex of a rattlesnake is extremely difficult. While I could not find when rattlesnake reach sexual maturity, the common garter snake (*Thamnophis sirtalis*) reaches this point between two to three years of age (Waye and Gregory 1998:292). At the time of birth, there is no significant sexual dimorphism but is defined gradually with age and by the time they reach sexual maturity, there is a 5% increase among male body size and by adulthood this difference reaches between 10 to 12% (Klauber 1937). Thus the species need to be determined, then its age, and finally the sex of the animal can be addressed.

Zooarchaeological evidence

Rattlesnake remains were scarce, with examples only prevalent in the FSP and the Teopancazco apartment compound[4]. From the FSP, at least three individuals were represented by vertebral and cranial elements from an offering cache (Unidad 100, Cuadroo 87, Layer LXXIII), vertebral elements in Burial 14, and cranial and vertebral elements were identified from the fill of the monument, totaling a MNI of five individuals from monumental proveniences. The Teopancazco apartment compound, on the other hand is represented solely by one individual composed on three vertebrae and one mandibular fragment (Rodríguez Galicia 2006:89).

Serpent symbolism in Mesoamerica

Serpents were graphically engraved throughout Mesoamerica as large stone architectonical sculptures such as those found in the Feathered Serpent Pyramid at Teotihuacan. They were associated with fertility, rebirth and transformation because they were observed shedding their skin (Miller and Taube 1993:149; Stone and Zender 2011:86). Slithering along the ground, their unique body movement were compared to naturel features like water and lightening that similarly meander (Seler 2004:267). These multifaceted characteristics of serpents linked them to the sky, earth and the underworld (Garza 2001). Another component of their physiology was closely watched; snakes have detachable joints in the head allowing them to open their mouths much larger than their heads to swallow their prey whole (Miller

[4] There was one rattlesnake present on surface levels of Oztoyohualco apartment compound (Valadez 1992: Appendix 2.2), but all surface layers, when indicated were not included in the MNI counts.

and Taube 1993:149). Thus serpents were illustrated as vision serpents with jaws wide open from which deities/ancestors emerged (Miller and Taube 1993:150; Schlesinger 2001:269).

The rattlesnake was associated with water due to the rattling sounds of its tail and because they emerge during the rainy season. Their trunks are marked by the precious stones of *chalchihuitli*, directly alluding to this connection with water (Bernal-Garcia 1993). These poisonous snakes were considered lightening that fell from the sky that were carried by the rain gods Tlaloc and Chac (López Austin and López Luján 2009:154; Miller and Taube 1993:150). Rattlesnakes were considered the head of all the other snake by both Maya and Nahua groups. In highland Mexico, the rattlesnake was called *tecuhtlacozauhqui* (the principle yellow serpent), playing a dominant role (Aguilera 1985:73). Even among the Maya who live with a range of other snakes that are both poisonous (fer-de-lance) and larger (*Boa constrictor*), the rattlesnake was associated with the mountain deities whom lived in the caves and controlled all other serpents (Aguilera 1985:73). Many highland deities like Coatlícue (serpent skirt) and most famously Quetzalcoatl (Feathered serpent) incorporated the rattlesnake as part of their identity.

Serpents were captured because their meat was eaten, their skin used, and had curative functions (Aguilera 1985:73). The hunter would scrub his/her hands with tobacco and go with a stick in hand. When they saw one they would throw tobacco towards them, aiming for the mouth, causing the serpent to faint. The rattlesnake is killed with the stick, its head and tail removed, whereby it was ready to be skinned and consumed (Aguilera 1985:74). If they want to capture the snake alive, they would extract the fangs and place it in a vase.

Other Fauna

Monkey (Ateles sp.)

Primate diversity is also extensive in greater Mesoamerican, with sub-tropical and tropical forests from the coast of Tamaulipas, Mexico extending along the Gulf of Mexico through the rest of southern Mexico and into Central America containing seven to nine specie and up to 22 taxa (Rylands, et al. 2006). The Ateles family has been categorized to two species, the Geoffroy’s spider monkey (*Ateles geoffroyi*) and the *A. fusciceps*, although it is debated if they should be distinguished in this manner (Rylands, et al. 2006).

Among the spider monkeys, there are two regions with distinct species that would have been available. The Mexican spider money (*Ateles geoffroyi vellerosus*) is distributed along the eastern coastal tropical zones down south and extending into western highland and coastal regions of southern Mexico, Guatemala, Honduras and El Salvador (eastern San Luis Potosí, Tabasco, Isthmus of Tehuantepec in eastern Oaxca and highlands of Guatemala) (Rylands, et al. 2006:63-65). On the other hand, the Yucatán spider monkey (*A. g. yucatanensis*) are found in the Yucatán peninsula into NE Guatemala, adjoining part of Belize (Rylands, et al. 2006:65-66). However, such sub-specie distinctions are very difficult, even utilizing pelage colors and only one study was able to differentiate based on breadth dimensions of the crania (Jones, et al. 1974:8), and no comprehensive study on post-cranial elements has been done so far to distinguish which specie, or sub-specie was represented from the burials.

As with most mammals, age of the individual, in this case because only postcranial elements were identified, rely on the size and fusion of the element in question. Sexing of the individual, particularly dealing with long bone elements (forelimb and possibly part of the forearm) with neither the specie nor the age designation is difficult, as most diagnostic elements are cranial or pelvic elements. However, the small size of the element in question suggested that we were dealing with an immature individual.

Rodríguez Galicia (2006) has also identified an *Ateles* sp. bone from the Teopancazco apartment compound suggesting that this foreign specie was transported to the ancient city. There is also mention of a spider monkey mandible from the Xalla complex (Valadez Azúa In press). Whether these elements reached the city center as skeletal parts or as live individuals is uncertain, but it certainly suggests fauna products moved across long distances.

Rabbits/Hares (Lagomorpha)

Cottontails (*Sylvilagus* sp.) and jackrabbits (*Lepus* sp.) were some of the most abundant species found from domestic contexts. Interestingly, they were also found in the stomach of the sacrificed individuals, and were probably the preferred food source to feed these victims. As only two of the stomach contents were identified as a hare and the majority represented cottontails, I concentrate on the cottontail's biological and zooarchaeological background.

What distinguishes cottontails from jackrabbits is that the former is smaller with shorter legs and ears, lives in burrows, inhabits less arid environments, and their young are born naked with eyes still closed (Leopold 1972:344-345). Their burrowing tendencies make this specie much more susceptible to management strategies, as jackrabbits tend to need large open habitats.

Species found locally in the Mexican Basin include the Eastern cottontail (*S. floridanus*), the Audubon cottontail (*S. audubonii*), the Mexican cottontail (*S. cunicularius*) and related specie, the volcano rabbit (*Romerolagus diazi*) (Leopold 1972). As no volcano rabbits were discovered from burial deposits I focus on the *Sylvilagus* species. Size ranges between 300 mm (*S. audubonii*) to as large as 445 mm (*S. cunicularius*), weighing between 750-2,300 g (Leopold 1972:Table 14). Variations in the ecological habitats range from those that prefer more arid, open deserts and grasslands (*S. audubonii*), to pine-oak forests (*S. floridanus*) and those that inhabit the semiarid thorn forest and tropical deciduous forest (*S. cunicularius*).

As fatty, defenseless game, the cottontails have a higher mortality rate than jackrabbits as multiple prey species prefer this animal. This is matched by the equally high reproductive rate, with gestation periods only lasting a month that produce four to six young, and can generate four to five litters a year with optimal food availability (Leopold 1972:357). This characteristic may be why they are resilient despite the high hunting rates.

Species distinctions are often based on size, although *S. cunicularius* can reach that of a small jackrabbit (Leopold 1972:352). Very detailed photographic collection of cottontails and jackrabbits were provided by Fabiola Torres that aided many of the species-level designations in the present study. Aging individuals with partially erupted cheek teeth can be determined to be younger than 21 days old (Hoffmeister and Zimmerman 1967:205). But once full dentition is attained at about one month of age, conventional tooth eruption and wear patterns cannot be applied as an age indicator because they have continuous growing teeth. Thus, age designations were based on the presence/absence of bone fusion and size of the bones. Particularly, fusion of the humerus is known to occur roughly around nine months of age (Hale 1949). Skull closure and size, particularly the closure of the exoccipital-supraoccipital suture are useful indicators of age classes as described by Hoffmeister and Zimmerman (1967). Between 4 months and 6 months rabbits reach complete adult size (Hoffmeister and Zimmerman 1967).

Breeding season of cottontails varied significantly by species, region and particularly is argued to be affected by rainfall (Mossman 1955). While Ingles (1941) found rabbits to reproduce year round, Sowls's (1957) study demonstrated the *Sylvilagus audubonii arizonae* breed from beginning of January to the end of late August. It is reported that they can have multiple litters a year with one to five embryo per litter (Ingles 1941). As the conditions and the reproductive cycles of the rabbits from the highland Mexican basin are unknown to us, their breeding cycles cannot be utilized to estimate the timing of the dedicatory burial.

As mentioned above, rabbit and hares were found abundantly in non-religious contexts, with 7 and 15% of the faunal MNI represented by hares (former) or rabbits (latter) (Appendix A). This was probably because in an urban settlement with only two domestic species available, the dog and the turkey, these small game were probably an optimal resource that was both locally available and easy to keep in small numbers at the household-level (Somerville, et al. 2014; Sugiyama, et al. 2014). FSP excavations have reported the presence of both jackrabbits, two *Lepus callotis*, and cottontails (17 of different species). Unfortunately, many of these finds were from fill layers, suggesting there was no link to religious functions of the burials, and several of them were found surrounding or in the same layer as other burials or offertory remains. Still, it is uncertain if any of these represent dedicatory subjects or were just part of the fill of the burial. None have any mention of being found as stomach contents, as was identified at the present study.

Methodological Overview

The zooarchaeological methodology described above was used to characterize the remains of over 150 animals from the Moon Pyramid and Sun Pyramid assemblages, all of which have secure chronological and contextual information that provide the basis for an in-depth reconstruction of the ritualized acts. Exquisite detail as to how the animal interacted with the Teotihuacan populace while they were alive, specific injuries or diseases the animals had, how the animals were handled and prepared into ritual paraphernalia, what the animals consumed prior to their sacrifice, and specifics as to how the individuals were buried has been gathered for this collection. Such analysis allows for interpretation at various levels, from recreating animal biographies to examining overall chronological patterns or even inter-species differences. Of course, this rich zooarchaeological dataset must be contextualized within the broader understanding of the ecological and behavioral traits of the animal that govern how humans interacted with the animal and how perceptions of these fauna were formulated. Viewing the zooarchaeological evidence at hand, there is already an apparent separation between animals found in domestic contexts and those reserved for special ritualized contexts. Now I present the raw zooarchaeological dataset in the subsequent two chapters.

CHAPTER 5:

Primary Burials: Victims of Sacrifice

The raw dataset of the dissertation project are presented in several chapters. The present chapter focuses on complete individuals highlighting some of the detailed zooarchaeological signatures used to reconstruct individual life histories. For each species, their abundance, distribution, age and sex profiles, and significant surface modifications are investigated to re-create what attributes were selected for in the ritual killing. Subsequently, Chapter 6 presents prepared faunal artifacts. It is after completing an overview of the isotopic dataset (Chapter 7) that the overall patterns — including the species representation, spatial distribution, and seasonality — are discussed for each of the offering contexts in Chapter 8. Then, a holistic reconstruction of the ritualization process is discussed.

This chapter begins with a detailed account of each species, particularly highlighting the zooarchaeological data of complete animal actors. This detailed analysis brings the animal's bodily remains to the forefront to tell the tale of how they would have been captured, managed, and interacted with the Teotihuacan population before being deposited into the dedicatory chamber. Specifics on infectious disease and injuries that signify their captive state is central to this dialogue, as well as the analysis of its stomach contents that help assess their diet during confinement. Specific attributes that help reconstruct if the animal was buried alive during the dedication ceremony are also discussed. Age and sex profiles that help understand the selection process and the timing of such events are also examined.

Felids

Felids, particularly pumas, were found in all offertory contexts in both the Moon Pyramid and Sun Pyramid (Appendix D). They are also the most abundant family (felidae) to be identified totaling 46 minimum number of individuals (MNI) (Table 5.1). Entierro 6 contained the most abundant evidence for complete individuals (n=4). As far as felid artifacts, Entierro 5 contained the highest MNI counts (n=16), mostly resulting from the composite artifacts that caused elevated MNI calculations. Before discussing details on the distribution and characteristics of felids, a note on MNI calculations is in order.

Table 5.1 Species distribution of all zooarchaeological remains from the Moon Pyramid and Sun Pyramid.

		Ent. 2			Ent. 6			Ent. 3	Ent. 5			PPS OF2			TOTAL
		MNI	Com	Incom	MNI	Com	Incom	Incom	MNI	Com	Incom	MNI	Com	Incom	
Aves															
Aquila chrysaetos	Golden eagle	9	9	-	18	9	9	-	1	1	-	1	1	-	**29**
Bubo virginianus	Great horned owl	2	-	2	-	-	-	-	-	-	-	-	-	-	**2**
Buteo sp	Hawk	3	-	3	-	-	-	1	1	-	1	-	-	-	**5**
B. magnirostris	Roadside hawk	-	-	-	-	-	-	1	1	-	1	-	-	-	**2**
B. jamaicensis	Redtailed hawk	1	-	1	-	-	-	-	-	-	-	1	1	-	**2**
Colinus virginianus	Bobwhite quail	-	-	-	2	-	2	-	-	-	-	-	-	-	**2**
Columbidae	Dove/Pigeon	-	-	-	-	-	-	-	3	-	3	-	-	-	**3**
Columbina inca	Inca dove	-	-	-	1	-	1	-	-	-	-	-	-	-	**1**
Corvus corax	Common raven	2	-	2	-	-	-	-	1	1	-	-	-	-	**3**
Falco mexicanus	Praire falcon	1	-	1	-	-	-	-	-	-	-	-	-	-	**1**
UnID Bird		2	-	2	3	-	3	1	-	-	-	-	-	-	**6**
Mammalia															
Ateles geoffroyi	Spider monkey	-	-	-	-	-	-	-	1	-	1	-	-	-	**1**
Canis sp	Canid	-	-	-	-	-	-	-	1	-	1	-	-	-	**1**
C. lupus baileyi	Mex grey wolf	1	1	-	9	1	8	17	2	1	1	1		1	**30**
C. latrans	Coyote	-	-	-	1	-	1	-	-	-	-	-	-	-	**1**
Felidae	Feline	3	-	3	1	1	-	1	3	-	3	-	-	-	**8**
Panthera onca	Jaguar	-	-	-	6	1	5	-	2	-	2	-	-	-	**8**
Puma concolor	Puma	3	2	1	7	3	4	6	11	1	10	2	-	2	**29**
Leporid	Rabbit/hares	1	-	1	-	-	-	-	-	-	-	-	-	-	**1**
Lepus sp.	Hare	2	-	2	-	-		-	1	-	1	-	-	-	**3**
Sylvilagus sp.	Cottontail	3	-	3	1	-	1	-	-	-	-	2	-	2	**6**
S. audubonii	Desert cottontail	1	-	1	3	-	3	-	-	-	-	-	-	-	**4**
S. floridannus	Eastern cottontail	1	-	1	1	-	1	-	-	-	-	-	-	-	**2**
Microtus mexicanus	Mex vole	1	-	1	-	-	-	-	-	-	-	-	-	-	**1**
Peromyscus sp.	Deer mouse	-	-	-	-	-	-	-	1		1	-	-	-	**1**
P. maniculatus	Deer mouse	-	-	-	-	-	-	-	3	-	3	-	-	-	**3**
Sciurus aureogaster	Mex gray squirrel	-	-	-	1	-	1	-	-	-	-	-	-	-	**1**
UNID Mammal		1	-	1	2	-	2	-	-	-	-	-	-	-	**3**
Reptiles															
Crotalus sp	Rattlesnake	6	6	-	18	18	-	-	9	9	-	-	-	-	**33**
Anura/Lacertilio	Frog/lizard	-	-	-	-	-	-	-	1	-	1	-	-	-	**1**
TOTAL		*43*	*18*	*25*	*74*	*33*	*41*	*27*	*42*	*13*	*29*	*7*	*2*	*5*	***193***

Most of these felid skulls were excavated in groupings of either the entire skeleton, the skull with or without the associated claws/phalanges, or as isolated bones like the claw/phalange, teeth or bony fragments that were assigned an Elemento number. This made MNI calculations extremely difficult, particularly in cases such as Entierro 5 that included composite artifacts; multiple teeth of various individuals were deposited together. Compounded with the very badly preserved skeletal elements that did not permit reconstructing its original form, many times the overlap of teeth was the only means of distinguishing between individuals. Thus the overlap analyses of cranial fragments were critical to calculate final MNI counts. Once MNI calculations were made, I prioritized Element numbers with cranial and dental fragments with species-level designation to determine age and sex distributions. Many times it was obvious that isolated specimens were probably part of a nearby Element number due to either the spatial placement or their skeletal distribution. Such specimens were not counted in the age and sex designation tables to avoid re-counting the same individual twice.

Unlike the zooarchaeological remains of eagles, there was a clear distinction between felids that were complete and obviously interred as sacrificed primary deposits and those that were prepared cranial heads. The only exception is Elemento 2227 from Entierro 6, which was composed of various long bone and other post-cranial fragments but were missing the cranium and mandible. Most likely one of the cranial heads found nearby was wrongfully assigned a separate Elemento number as the field drawings clearly demark Elemento 2227 as a complete individual, and thus has been analyzed as such.

Complete primary felid deposits were much less abundant than animal paraphernalia and are not found in all contexts. Complete animals were only found in Entierros 2, 6 and 5. However, all offerings included felid cranial elements as offertory artifacts. A total of seven felids were found as complete individuals: two from Entierro 2, four from Entierro 6 and one from Entierro 5.

The age distribution of felids found complete versus those deposited as prepared artifacts differ significantly. Among complete individuals, there was a clear preference for specific age categories, as only juveniles and young adults were deposited complete (Table 5.2, Figure 5.1). On the other hand, there is much more variation among the age ranges found with prepared artifacts. This preference was probably

Table 5.2 Age distribution of felids from each dedicatory chamber.

	Senior	Adult	Young Adult	Juvenile	Infant	UnID	Total
Burial 2							
Complete	-	-	2	-	-	-	**2**
Head	-	-	-	1	3	-	**4**
Burial 6							
Complete	-	-	3	2	-	-	**5**
Head	-	-	1	3	5	-	**9**
Burial 3							
Head	2	3	-	1	-	1	**7**
Burial 5							
Complete	-	-	-	1	-	-	**1**
Head	-	8	6	1	-	-	**15**
PPS-OF2							
Head	-	-	1	-	-	-	**1**
Total	***2***	***12***	***13***	***9***	***8***	***1***	***44***

the result of multiple factors including the symbolic meaning of the animal, the difficulties involved in transportation of live animals, when the sacrifices took place, and how the animals were captured and/or maintained. Prepared felid heads have fewer restrictions as they can be acquired at various moments, be prepared over a long time at different stages and locations, and brought together with varied depositional histories.

The overall abundance of juvenile and young adults among the complete individuals, particularly young adults ranging between a year and a half to two years of age, suggests these animals were either preferentially selected during this age range, or other external factors caused the observed uniform distribution. By this age, felids transition into adulthood, nearly becoming independent from the mother. However, they would not have reached sexual maturity. Their pelage would more readily resemble an adult, particularly for the puma, whose cubs exhibit dark spots on its coat that should have completely faded by this point. This is also when felids transition into solitary animals, at which point they develop expansive territorial home ranges. Indeed once they reach this stage, with the additional strength and size, they would have been highly dangerous to raise and tame. Since young adults were found in multiple contexts spanning different periods, this uniform age selection suggests felids were captured on multiple

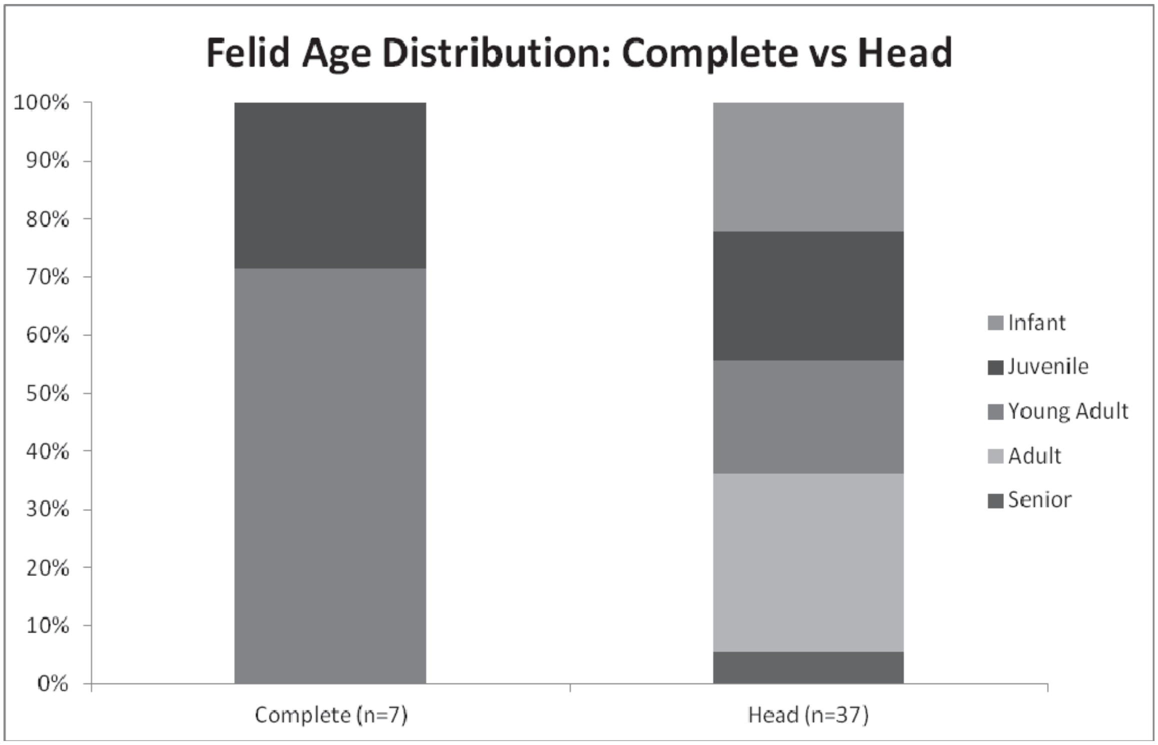


Figure 5.1. Age distribution (percent) of felids for all offerings.

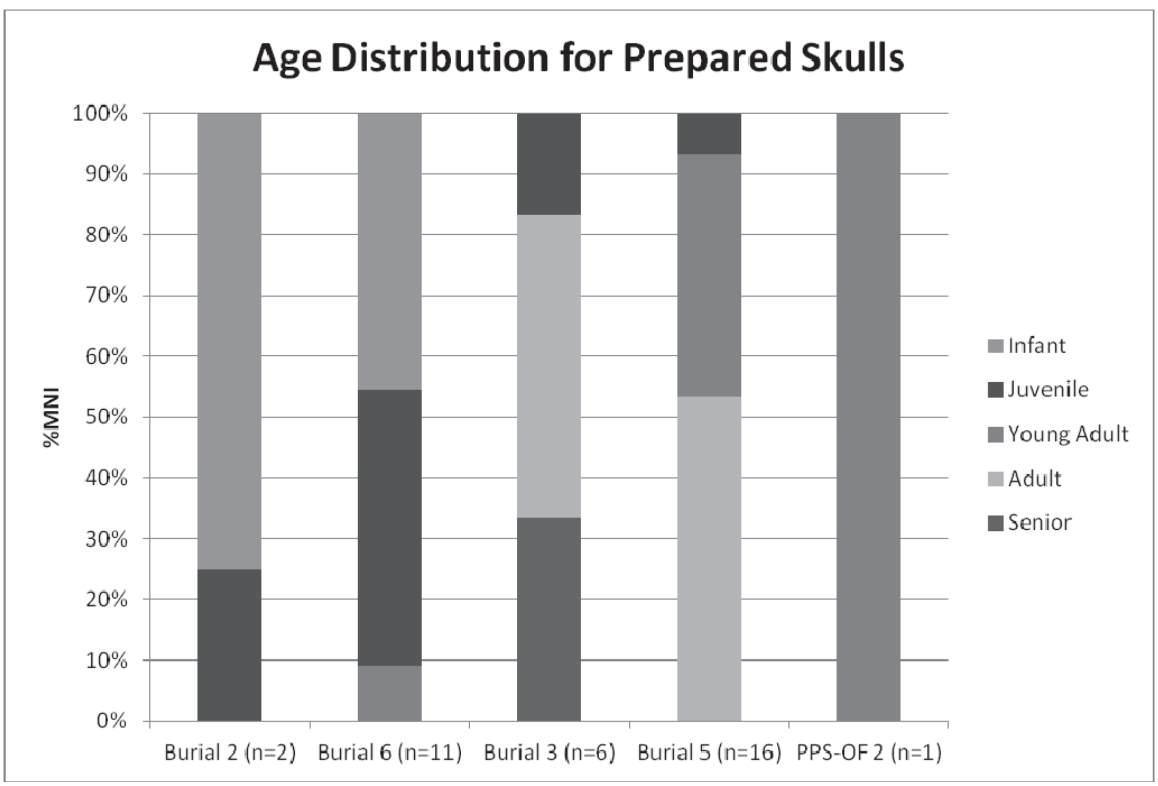


Figure 5.2. Age distribution (percent) of secondary deposits for each dedicatory cache.

occasions in a similar timing in anticipation to the ritual event. They were obviously favoring this age class when they would have looked close to adult in pelage and size, but would have still been able to cope with the presence of other felids.

There are several trends in the age distribution of secondary deposits (Figure 5.2). The two Entierros associated with Building 4, Entierros 2 and 6 are similar in their overall predominance of infant and juvenile heads, with only one young adult skull found in Entierro 6. Later deposits, Entierros 3 and 5, on the other hand, tended to favor more mature individuals; they are predominantly composed of adults while young adult and senior individuals are also found frequently. Juveniles were only minimally represented in both cases and no infants were identified. The sole felid excavated in the Sun Pyramid was of a young adult. Because it was the only specimen from this context, it cannot be determined if this find contradicts the trends found in Entierros 2 and 6 at the Moon Pyramid that roughly overlap chronologically, which emphasized infant and juvenile prepared heads. Nonetheless, there was a clear shift across time at the Moon Pyramid from favoring younger prepared felids to utilizing older crania. While this is discussed in more detail in the subsequent chapter, here I merely mention that this was probably caused by differing preparation techniques; many of the young crania found in Entierros 2 and 6 maintained the original form of the complete skull while later deposits, particularly in Entierro 5, were extensively altered.

Only three males, one possible male, three females and one possible female were identified from the entire collection (Table 5.3). Unfortunately the number of sexed animals is too small to examine such general patterns. Now I discuss details of the zooarchaeological investigation of felids from each of the offertory contexts.

Moon Pyramid: Entierro 2

This offering contained some of the most convincing evidence that complete felids were interred alive (Table 5.3). Unlike the decapitated human skeletal remains from Entierro 6, the cause of death was not from other wounds inflicted on the animal but from the depositional process. Two felids were found on the northern sector of the cache stacked on top of each other in wooden cages. The degraded wooden

Table 5.3 Summary of the felid skeletal remains from all offerings. Ph=phalange, Yng=young, Juv=juvenile.

Elemento #	Species	Bone	Age	Sex	Surface	Pat	Stomach	Notes
Entierro 2								
143	Puma	Complete	Yng adult	F?	No	No	No	Caged animal.
151	Felis sp.	Claw/Ph	Infant/Juv	UnID	No	No	No	
154	Puma	Complete	Yng adult	M	No	No	No	Caged animal.
167.1	Felis sp.	Skull and claws	Infant	UnID	Yes	No	No	Deciduous teeth.
167.3	Felis sp.	Isoltaed bone	Adult	UnID	No	No	No	Mixed fragments. Not part of MNI calculation.
187	Felis sp.	Skull	Infant	UnID	No	No	No	Asociated with individual 2-A. Deciduous and permanent teeth (7-8 months of age).
192, 189	Felis sp.	Skull	Infant	UnID	Yes	No	No	Deciduous teeth.
270	Puma	Skull	Juvenile	UnID	No	No	No	Some deciduous teeth.
330	Felis sp.	Claw/Ph	Infant/Juv	UnID	Yes	No	No	
Entierro 6								
1818.1	Puma	Complete	Yng adult	F	No	Yes	Yes	Various pathologies, consumed cooked rabbits.
1887	Jaguar	Complete	Yng adult	UnID	No	No	No	
1941	Puma	Skull	Yng adult	M	Yes	No	No	
1960	Jaguar	Skull	Infant	UnID	Yes	No	No	Deciduous teeth.
1984	Puma	Complete	Yng adult	F	Yes	Yes	No	
1991.1	Felis sp.	Complete	Juvenile	UnID	No	No	Yes	
2043	Jaguar	Skull	Infant	UnID	No	No	No	
2044	Puma	Various	UnID	UnID	No	No	No	Isolated fragments of phalange, tarsal/carpal bone, incisor, and ear bone. Probably from other element nearby.
2068	Puma	Skull	Juvenile	UnID	Yes	No	No	
2071	Jaguar	Skull	Infant	UnID	Yes	No	No	Deciduous teeth.
2195	Jaguar	Skull	Infant	UnID	Yes	No	No	Deciduous and permanent teeth erupting.
2223	Jaguar	Skull	Juvenile	UnID	Yes	No	No	
2227	Puma	Probably complete	Juvenile	UnID	Yes	No	No	Missing the head and various long bones but field drawings of complete individual.
2228	Puma	Skull	Juvenile	UnID	Yes	No	No	
2243.2	Felis sp.	Claw/Ph	Juvenile	UnID	No	No	No	
2245	Puma	Skull	Infant	UnID	No	No	No	Deciduous and permanent teeth erupting.

Table 5.3 Continued

Elemento #	Species	Bone	Age	Sex	Surface	Pat	Stomach	Notes
Entierro 6 cont'd								
2253.2	Felis sp.	Claw/Ph	UnID	UnID	No	No	No	
-9999	Felis sp.	Various	UnID	UnID	No	No	No	Various fragments of teeth and bone. No element number.
N4.31	Jaguar	Various	Juvenile	UnID	No	No	No	Teeth and blocks of unidentified degrated bone.
Entierro 3								
512	Felis sp.	Teeth	Adult	UnID	Yes	No	No	Cut canine.
560.1	Puma	Skull	Adult	UnID	No	No	No	
571.1	Puma	Skull and claws	Senior	M	Yes	Yes	No	
573.2	Felis sp.	Claw/Ph	UnID	UnID	No	No	No	Probably from other element nearby.
574.2	Puma	Teeth	Juv/adult	UnID	Yes	No	No	Cut canine.
575.2	Felis sp.	Claw/Ph	UnID	UnID	No	No	No	
576.2	Felis sp.	Claw/Ph	Juv/adult	UnID	No	No	No	
578.2	Puma	Teeth	Juv/adult	UnID	No	No	No	
579.3	Felis sp.	Claw/Ph	UnID	UnID	No	No	No	
597.3	Puma	Skull	Adult	UnID	No	No	No	
620.1	Puma	Skull	Adult	UnID	Yes	No	No	
620.2	Puma	Teeth	Adult	UnID	No	No	No	Right M1 superior.
632.1	Puma	Skull	Senior	M?	No	No	No	
632.2	Puma	Skull	Juvenile	UnID	No	No	No	
691.1	Felis sp.	Skull	UnID	UnID	No	No	No	
Entierro 5								
1054	Puma	Skull	Adult	UnID	No	No	No	
1318.2	Felis sp.	Claw/Ph	UnID	UnID	No	No	No	
1380	Felis sp.	Skull	Adult	UnID	No	No	No	Red pigment on mandible fragment.
1381.1	Jaguar	Skull and claws	Adult	UnID	No	No	No	
1381.2	Puma	Skull and claws	UnID	UnID	No	No	No	
1382.1	Felis sp.	Skull	Adult	UnID	No	No	No	
1382.2	Puma	Skull	Yng adult	UnID	No	No	No	
1382.3	Felis sp.	Skull	Yng adult	UnID	No	No	No	

Table 5.3 Continued

Elemento #	Species	Bone	Age	Sex	Surface	Pat	Stomach	Notes
Entierro 5 cont'd								
1382.4	Felis sp.	Skull	Juvenile	UnID	No	No	No	
1382.5	Felis sp.	Skull	Adult	UnID	No	No	No	
1422	Felis sp.	Claw/Ph	UnID	UnID	No	No	No	
1446.3	Felis sp.	Claw/Ph	Infant	UnID	No	No	No	
1447.1	Felis sp.	Claw/Ph	UnID	UnID	No	No	No	
1500	Puma	Skull	Adult	UnID	No	No	No	
1505	Jaguar	Skull	Yng adult	UnID	No	No	No	
1506	Felis sp.	Claw/Ph	UnID	UnID	No	No	No	
1517	Puma	Skull and claws	Yng adult	UnID	No	No	No	
1565	Felis sp.	Claw/Ph	UnID	UnID	No	No	No	
1570	Felis sp.	Claw/Ph	UnID	UnID	No	No	No	
1584	Felis sp.	Skull	Adult	UnID	No	No	No	
1587.1	Felis sp.	Skull	Adult	UnID	No	No	No	
1587.2	Puma	Skull	Adult	UnID	No	No	No	
1587.3	Puma	Teeth	Yng adult	UnID	No	No	No	
1587.4	Puma	Teeth	Yng adult	UnID	No	No	No	
1593	Puma	Skull	Adult	UnID	No	No	No	
1636.1	Puma	Skull	Adult	UnID	No	No	No	
1638.2	Felis sp.	Claw/Ph	UnID	UnID	No	No	No	
1639	Puma	Complete	Juvenile	UnID	No	No	No	Very degrated but was probably a complete ind.
S3E3.4	Felis sp.	Skull frag.	UnID	UnID	No	No	No	Probably from other element nearby.
S5E3	Felis sp.	Mandible	Adult	UnID	No	No	No	Probably from other element nearby.
PPS OF 2								
151.2	Felis sp.	Teeth	UnID	UnID	No	No	No	Right mandibular I2 and I3 found with Ele 151.1 making the MNI two indivdiuals .
151.1, 315, 309	Puma	Skull and claws	Yng adult	F	Yes	No	No	

post holes clearly delineated the cages that were roughly 1 m to 1 ½ m long, 80 cm wide and 60 cm high (Figure 5.3). The presence of cages demonstrates the beasts were brought into the offertory environment alive. The third cage in this context contained a wolf on the southern sector.

The puma assigned as Elemento 143 was a complete, well preserved individual, although the cranium exhibited some degree of fragmentation. The entire skeleton was reconstructed without difficulty (Figure 5.4). This individual was a probable female puma assigned as a young adult. This designation was based on the presence of a full set of permanent dentition with hardly any wearing, making this individual older than one year of age, but its long bones, skull and other fusion plates remained unfused. This suggests this felid was a young adult, between one and a half to two years of age.

Elemento 154, the second complete and well preserved puma was positioned on top of the former. Like the other puma, it was assigned as a young adult ranging from one and a half to two years of age due to the same dental and osseous features. Furthermore, the temporal ridge was still moving its way medially toward the sagittal crest, suggesting it was not a mature adult. Due to the very pronounced musculature, particularly along the temporal ridge and sagittal crest, this individual was assigned as a male. This caged individual had excreted, leaving coprolites in the cage, again confirming this animal was alive at the time of deposition. Interestingly, some non-felid remains were mixed in the coprolites and the rib cage that represents its stomach contents. They included isolated bones of small mammal and/or avian materials including a vertebra, metapodial fragment, phalange, teeth and claw of a Leporid, possibly a *Sylvilagus* sp. This data demonstrates two things, first that the animal was fed some time prior to its sacrifice, most probably as part of the ritualization process. This is inferred by the uniformity in the stomach contents. Secondly, the presence of these coprolites confirms that not only was the animal brought in alive to the ritual scene, it remained alive for some time before it was buried. The lack of any pathological features indicating the cause of death strengthens the argument these beasts were buried alive.

Besides these two complete animals sacrificed in Entierro 2, four skulls, some with associated phalanges/claws, and several isolated bone and claw/phalange concentrations were excavated (Table 5.3). The isolated specimens and claws/phalanges were probably just de-associated from the original skull or

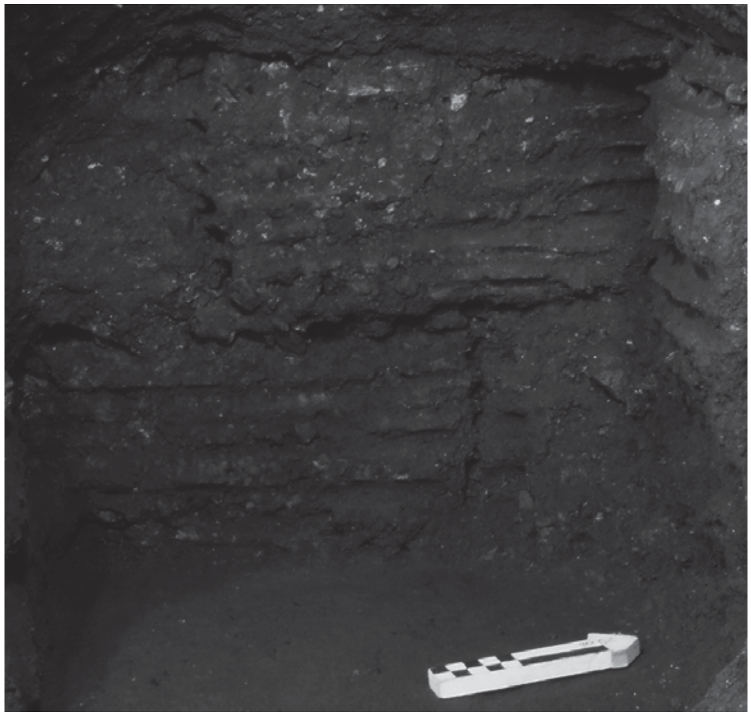
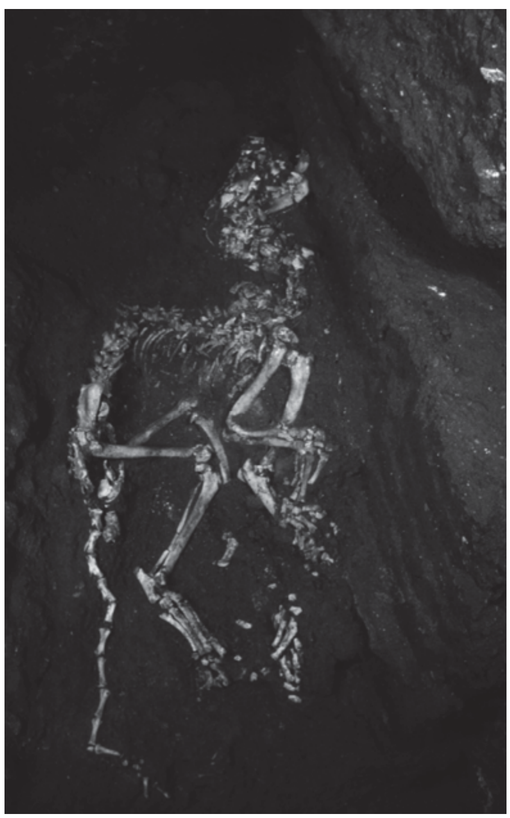


Figure 5.3. Vertical post holes of the two wooden cages that contained the remains of the two pumas, Elemento 143 and Elemento 154 from Entierro 2. (Photograph © Moon Pyramid Project).

a) 

b) 

Figure 5.4. Puma (Elemento 143) from Entierro 2; a) *in situ* during excavations (photograph © Moon Pyramid Project), and b) after restoration and zooarchaeological analysis.

complete individual, and thus were not calculated as an additional individual in MNI counts. In total an MNI of six felids were represented in Entierro 2. The age distribution of the skulls ranged from infants to juveniles (Table 5.2), suggesting that there was a preference for younger specimens and avoided the use of adult and senior skulls. As many of these cranial fragments were either highly fragmented or very young, the sex of the animal was not discernible.

Moon Pyramid: Entierro 6

Entierro 6 had the most number of complete felids in any single context from Teotihuacan (Table 5.3). It also provided the first evidence of a complete jaguar skeleton found at this site. However, the identification of many of the jaguars are pending verification utilizing a comparative collection of young jaguar skeletons applying more rigorous morphometric methodology. No statistical analysis of the metric data has been completed at this point, and young skulls were lacking from the comparative collection at time of identification. Examining the age distribution, there is an apparent favoritism towards individuals that were either infants or juveniles, and only a couple of young adult individuals.

Several of the felids exhibited various surface modifications and other features that permitted an in-depth reconstruction of the animal's life history. This included indications of stress, disease, health and nutrition that all suggest the animal was kept in an artificial environment for prolonged periods.

Elemento 1818 provides the most convincing evidence that pumas were kept in an artificial environment. This young female, about 18 months of age, was probably brought into the city as a cub. During its capture or confinement, this animal experienced a non-fatal injury on its right lower limb. It is at this point that its femoral head was dislodged, affecting the acetabular joint significantly making it impossible for the felid to run properly. In the wild such an injury would have been fatal for a solitary predator such as the puma. Yet, the presence of remodeling around the femoral shaft and the acetabulum that is completely deformed obliquely suggests this individual survived the injury (Figure 5.5 a,b). While it was impossible to reconstruct the right innominate completely, the preserved areas demonstrated extensive remodeling and infection not just along the acetabulum, but into the ischium. This injury would have restricted the animal significantly and caused extreme pain. This animal also experienced a blow to

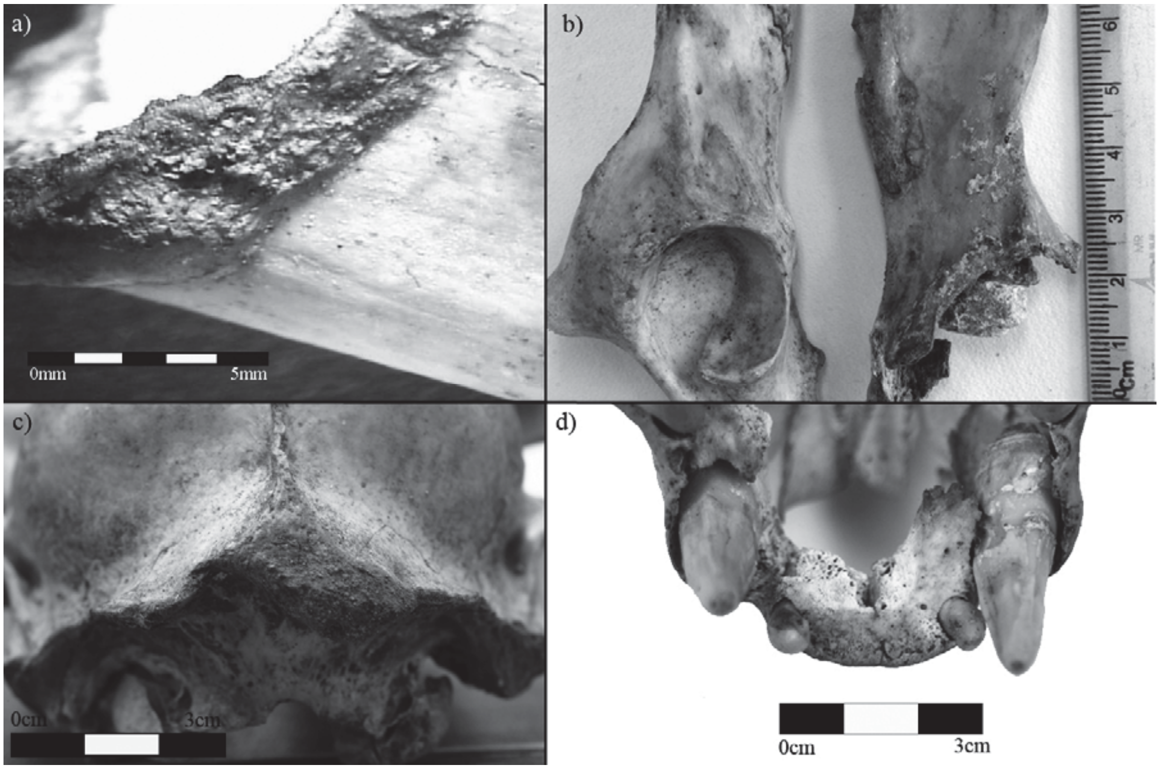


Figure 5.5 Details from zooarchaeological analysis of a puma (Elemento 1818); a) close up of the right femoral shaft with evidence of remodeling; b) comparison of left and right innominate with obvious deformation of the right innominate (right side); c) close up of the occipital region with a large bump from an injury; d) close up of maxillary mesial dentition with evidence of extensive wearing on the incisors and canines, note absence of first and second incisors.

the back of its head that could have also been inflicted during capture or confinement (Figure 5.5 c).

Other indications of stress are exhibited on its dentition. Despite the young age of the individual, there is already extensive wearing on the mesial dentition, particularly on the incisors to the point that the first and second incisors are completely warn down and absent (Figure 5.5 d). The alveolar had completely filled in, suggesting these incisors were lost some time before the puma met its fate. As felids do not regularly utilize their front teeth for consumption or for hunting, such wearing patterns are unique and merit considering the plausible causes. Indeed the carnassial utilized for food processing look healthy with very little ware. One feasible explanation is that its residence in small confined spaces could have caused abnormal stress. Behaviors like pacing, head bobbing, suckling on the tail and toes, and fur plucking have been recorded among wild tigers in modern zoological parks (Pitsko 2003). Additionally gnawing may have occurred, particularly on the cage or other restricted devices that could lead to the pathological feature described above.

Another clear indication this animal was tamed and managed was derived from its stomach contents. Several complete animals, including this puma, contained stomach contents that recorded their last meal before the ritual slaughter. The uniform assemblage, mostly consisting of either rabbits or hares suggests there was intentional feeding prior to their sacrifice. In this case, the remains of two rabbits that were fairly complete and an unidentified avian bone was identified. Some of the remains of the rabbit were discolored, demonstrating evidence of burning, and thus cooking prior to it being fed to this carnivore. These modified bones are a direct reference to artificial feeding, a feature that further supports that these highly specialized carnivores were tamed.

Just south of this individual, on the southwest corner of the dedicatory cache, two more complete felids were deposited, Elemento 1984 and 1887 (Figure 5.6). Unfortunately, this section with overlapping skeletons was very was badly preserved, resulting in a much more restricted analysis. The surface visibility was poor and many elements were missing, making it necessarily to rely on very small cues for interpretation.

The puma, Elemento 1984 was also a young adult, again roughly 18 months of age and a female. The very fragmentary state of the bones made many of the surface modifications difficult to discern. Nonetheless, some of the long bone fragments that were carefully pieced together demonstrated unusual deformations, remodeling and lipping on some of the upper limb elements. Particularly noticeable on the left upper limb, the radius and ulna were completely fused together. While it is still unclear if this would have been caused by some sort of infectious disease or injury, it seems to have also affected the corresponding humerus to some degree. Most likely, it was some sort of infectious disease due to nutritional deficiency or an infection that grew from an injury that affected the entire left upper limb. Further consultation with some veterinarian or zoological experts may help further explain this pathological marker.

Figure 5.6 Two felids (Elementos 1984 and 18877) in southwestern corner of Entierro 6 (Photograph © Moon Pyramid Project).

Laid right on top of this individual was the remains of Elemento 1887, a young adult jaguar of an indeterminate sex. This individual, although a little better preserved than Elemento 1984, was heavily affected by the same taphonomical processes making the bones very brittle. Reconstructions were difficult, compounded by the deformation and warping caused by the weight on the bones. Needless to say discerning any surface modifications were difficult due to these conditions. While there were no obvious pathological markers on this collection, some deformations cannot be discounted as being caused by cultural processes. The left forelimb, particularly along the shaft of the humerus, radius and ulna were inflated. Although this feature may be caused by the warping due to the taphonomical processes, it is more likely an infectious disease led to the inflammation. Other lines of evidence are necessary to determine if this individual was kept in management during its youth.

Another complete felid, Elemento 1991, was a juvenile of an unidentified sex. This individual was placed on the eastern sector of the cache, roughly at the same north-south coordinate as the puma Elemento 1818, almost mirroring this individual. Many of its teeth were still deciduous, but because the cranium and part of the mandible were fragmented, many un-erupted permanent dentition were identified. While the permanent maxillary incisors one and two had already erupted, the third incisor, canines, premolars and molars were still in the alveolar cavity. Some of the deciduous incisors on the mandible were still in place, with the permanent dentition just about to erupt. The canines and the cheek teeth were still deciduous. Based on this tooth eruption sequence, it was determined that this animal was between six to eight months old.

Like other animals, this felid also contained the osseous remains of its last meal. It consumed a young rabbit (*Sylvilagus* sp.), although only scant remains of its hind limbs were recorded. Due to the glossy texture of the bones these remains were originally identified as cooked, possibly boiled, remains. However, this type of polishing was most likely caused by the digestive tract. No other signs of surface modification were recorded. Apart from these complete individuals four puma skulls and six jaguar skulls were deposited throughout the offertory chamber. These crania are fairly consistently placed in sets of one or two in the corners of the cache, along the axial directions and at the center of the offertory cache.

Moon Pyramid: Entierro 3

No complete felid skeletons were deposited in Entierro 3. In fact, this offering did not include primary animal deposits. These prepared heads were highly fragmented making it difficult to discern any surface features (Table 5.3). Overlap analysis of these elements suggest six felid skulls were offered. They were scattered throughout the cache along with more abundant canid remains.

Moon Pyramid: Entierro 5

Only one puma (Elemento 1639) in Entierro 5 was a primary burial, laid on its side in front of one of three human, 5-C. This puma was a juvenile, again with permanent dentition and unfused cranial and post-cranial elements. However, its skull and post-cranial elements were significantly smaller, suggesting this individual was younger than the other complete young adult felids identified in other contexts. Its remains were greatly damaged by the taphonomic processes, making the surface look almost weathered. Unfortunately this led to the very brittle and warped nature of the skeleton, making the piecing, reconstruction and analysis very difficult. Thus only the dentition, part of the skull and some of the extremities and vertebrae were reconstructed while the other bones were too fragmentary and fragile for further manipulation and re-piecing. No information on surface modifications was gathered for this individual.

Most numerous among the faunal materials from this chamber were the abundant felid cranial heads (n=15) that were scattered surrounding the three sacrificial victims (Table 5.3). They included at least ten puma, two jaguar and three unidentified *Felis* sp.

Sun Pyramid: Ofrenda 2

Only one felid was found in this offertory chamber represented by the cranium, mandible and several phalanges/claws (Table 5.3). This individual was assigned three Elemento numbers (151, 315, 309) due to the different stages in which the faunal remains were recovered, but they all pertain to the same individual. This puma was assigned as a female young adult due to the complete permanent dentition, but the lack of any wearing on these teeth and the unfused cranial sutures confirms that it had not reached full adulthood. Light muscle markings along the parietal bones and the characteristics of the sagittal crest both confirm this individual was female.

This feline was placed on the northwestern sector of the cache facing west. The phalange/claw bones were scattered in three locations, immediately to the north of the skull, to the west of the skull, and another group isolated to the southwest of the skull. While initially this isolated group of phalanges/claws were considered a different felid, upon laboratory analysis it became obvious that they were of the same rough size and there were no skeletal overlap, resulting in the designation of only one felid for both the phalanges/claws and the skull. When the skull of the felid was analyzed, there were two teeth that overlapped with the full dentition identified with the skull of the animal suggesting that a total of two felids were represented. Two right mandibular second and third incisors were designated as Elemento 151.2, the second felid in this offering.

Canids

Canids, mainly wolves were found in all offerings totaling 32 skeletons (Table 5.4, Appendix E). Unlike other animals, the majority of canid remains were secondary deposits, with only three isolated

Table 5.4 Summary of canid skeletal remains from all offerings.

	Specie	Primary	Age	Sex	Path	Surface	Stom	Notes
Ent.2								
213.1	Wolf	Yes	Juvenile	M	No	No	Yes	Caged animal.
Ent. 6								
1959	Coyote	No	Juvenile	F	No	No	No	
2072	Wolf	No	Juvenile	UnID	No	Yes	No	
2079	Wolf	No	Young adult	F?	No	Yes	No	
2194	Wolf	No	Adult	F	No	Yes	No	
2221	Wolf	No	Young adult	UnID	No	Yes	No	
2224	Wolf	No	Adult	UnID	No	No	No	
2229	Wolf?	No	Juvenile	UnID	No	Yes	No	Initial ID as hybrid.
2243	Wolf	No	Juvenile	UnID	No	No	No	
2244	Wolf	No	Juvenile	UnID	No	No	No	
2199	Wolf?	Yes	Juvenile	F	No	No	No	Initial ID as hybrid.
Ent. 3								
570	Wolf	No	Young adult	M	No	No	No	
572	Wolf	No	Young adult	F?	No	No	No	
573.1	Wolf	No	Adult	UnID	No	No	No	
574.1	Wolf	No	Adult	UnID	No	No	No	
575.1	Wolf	No	Juvenile/ Adult	UnID	No	No	No	
576.1	Wolf	No	Adult	UnID	No	No	No	
577.1	Wolf	No	Juvenile/ Adult	UnID	No	No	No	
578.1	Wolf	No	Adult	UnID	No	No	No	
579.1	Wolf	No	Adult	UnID	No	Yes	No	
579.2	Canis sp.	No	Adult	UnID	No	No	No	Only represented by maxillary left I3.
580	Wolf	No	Adult	UnID	No	No	No	
597.1	Wolf	No	Juvenile/ Adult	UnID	No	No	No	
597.2	Wolf	No	Adult	UnID	No	No	No	
601.1	Wolf	No	Adult	UnID	No	No	No	
601.2	Canis sp.	No	Juvenile/ Adult	UnID	No	No	No	Three teeth.
606	Wolf	No	Adult	M	No	No	No	
642	Wolf	No	Juvenile	UnID	No	Yes	No	
746	Wolf	No	Adult	UnID	No	No	No	
Ent. 5								
1543	Canis sp.	No	UnID	UnID	No	No	No	One claw.
1508	Wolf?	No	Juvenile	UnID	No	No	No	Initial ID as hybrid.
1636.2	Wolf	Yes	Juvenile	M	No	No	No	
1447.2	Canis sp.	No	UnID	UnID	No	No	No	One claw one phalange.
OF 2, PPS								
209	Wolf	No	Infant/ Juvenile	UnID	No	Yes	No	4-5 months of age.

primary deposits in Entierros 2, 6 and 5. Unfortunately, many of the complete individuals were poorly preserved, making it impossible to reconstruct the entire skeleton. The only exception was Entierro 2, where the entire animal was preserved. Entierro 3 contained the largest assemblage of canid remains where 17 prepared crania were scattered throughout the chamber.

On many occasions only the dentition was reconstructable for very rudimentary identifications. Luckily many of characteristics distinguishing the species of canid — wolves, dogs, coyotes and hybrid forms — are based on morpho-metric traits of its dentition. Thus only one individual is left as an unidentified *Canis* sp. On the other hand, characterizing males and females are reliant on morphometric characteristics of cranial and post-cranial elements not available due to the conditions of the bones. Thus the majority of the canids remain unsexed.

Species level identification was initially carried out in the field and later laboratory contexts, then final identifications were assigned based on metric data taken from published reports. Two teeth were utilized: the maxillary third premolar (PM3) and fourth premolar (PM4). The comparative dataset from published reports (Blanco Padilla, et al. 2009) were taken to build the models for wolf, coyote and dog dental measurements (Figures 5.7 and 5.8). The centroid denotes the average measurements based on a comparative sample of wolves (n=10), coyotes (n=10) and dogs (n=9) with error bars signifying the range of two standard deviations (Appendix B). The polygons surrounding each of these three species represent the distribution of data points from the comparative sample. While the modern comparative measurements are not a representative sample due to the small sample size, it provides a useful model to compare the measurements taken from the archaeological samples.

Plotting the measurements taken from Teotihuacan contexts coded by initial field and laboratory identifications, we see the overall cluster with the comparative wolf measurements (Figures 5.7 and 5.8). The exception is Elemento 1959, identified as a coyote from Entierro 6 that is located just on the boarder of the expected coyote measurements. Interestingly, three individuals were identified as a possible hybrid during field and laboratory analysis (grey circles, not all individuals had both length and width measurements of PM3 and PM4). However, because their teeth dimensions are well within the expected

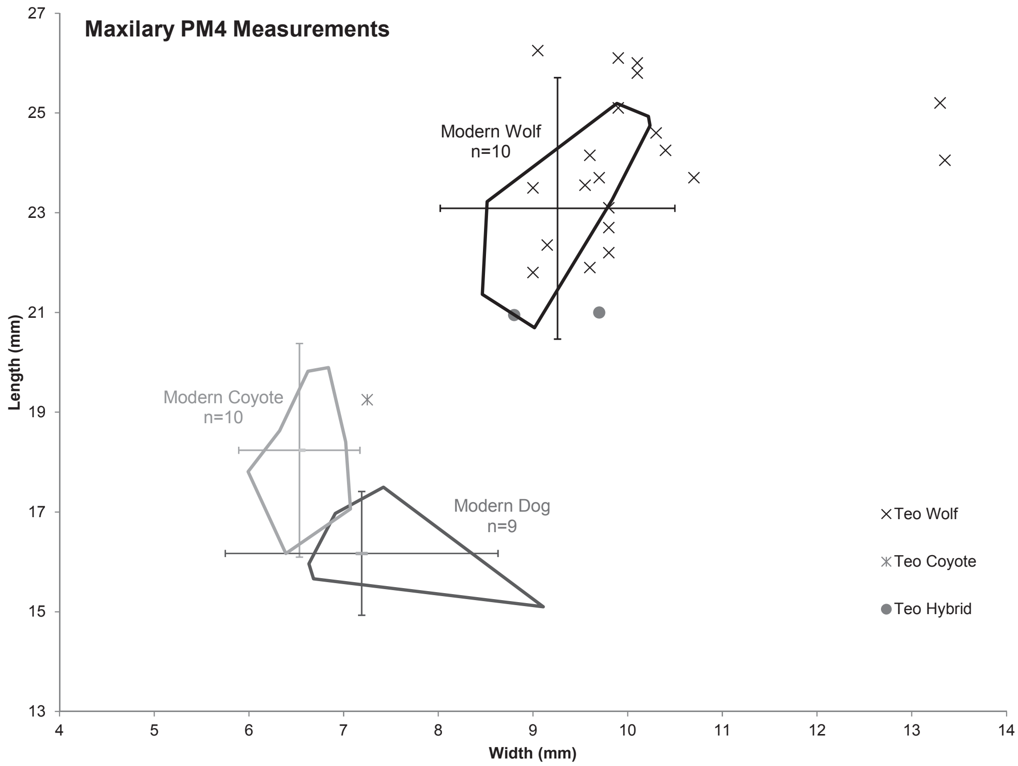


Figure 5.7 Canid fourth premolar length and width measurements (archaeological and comparative samples). Error bars illustrate two standard deviations while polygons plot sample distribution.

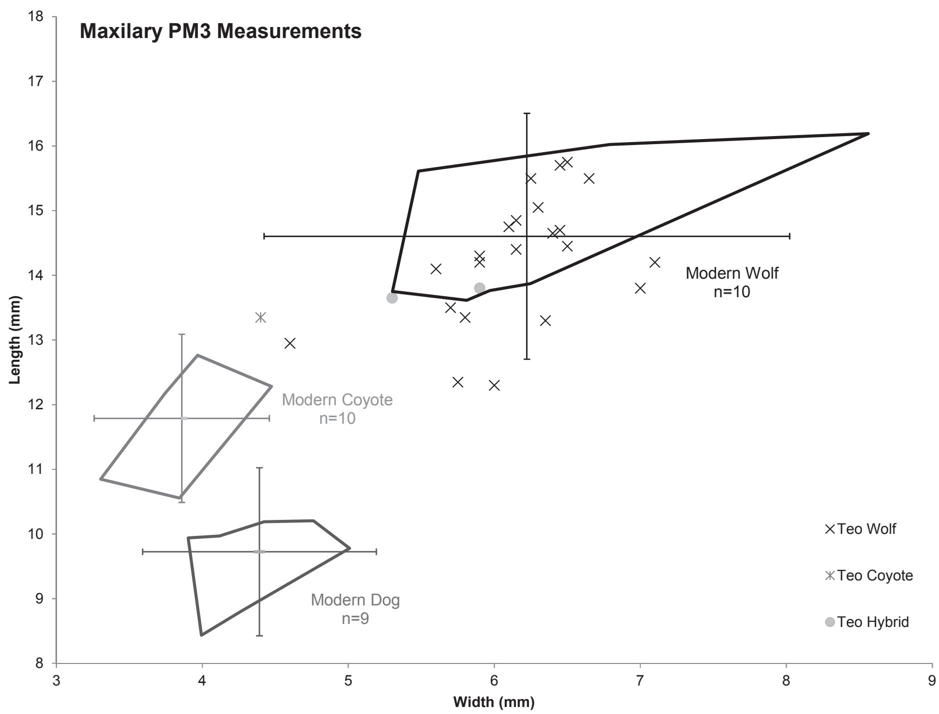


Figure 5.8 Canid third premolar length and width measurements (archaeological and comparative samples). Error bars illustrate two standard deviations while polygons plot sample distribution.

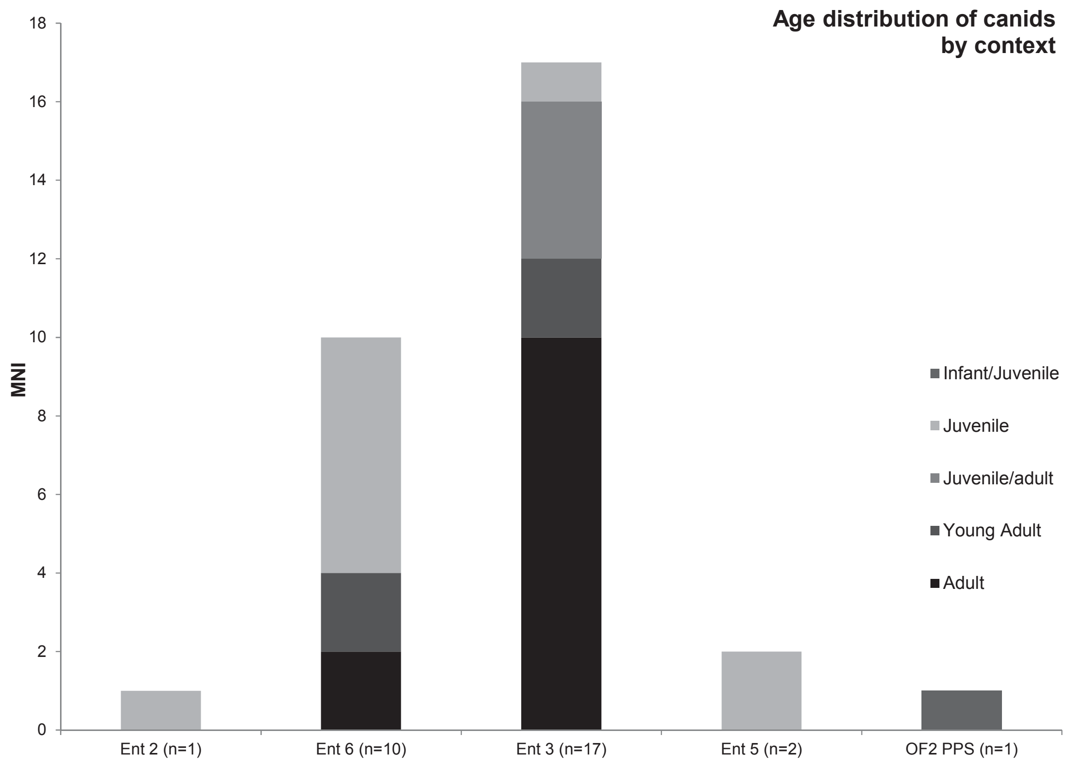


Figure 5.9 Age distribution of canids from all offerings.

two standard deviation variation, their identifications were changed to "wolf?" Further multivariate analysis utilizing a larger comparative sample is necessary to confirm this identification. Measurements of the Teotihuacan archaeological collection extend beyond the expected length and width measurements of the modern wolf collection, which demonstrates that the comparative sample needs to be expanded to account for larger inter-species variation.

Age distribution varied between contexts: young infant/juvenile and juvenile bones were prominent in Entierros 2, 6 and 5 and Ofrenda 2, while Entierro 3 contained older adults, young adults and juvenile/adult skeletal remains (Figure 5.9). Expect for the two juvenile heads found in Entierro 5, it is consistent with the felid age distribution where the earlier contexts (PPS OF2, Entierro 2 and Entierro 6) tended to prefer infant, juvenile, and young adult skeletons. On the other hand, later deposits, in this case Entierro 3 that contained the largest canid assemblage, tended to select adult individuals. Due to the overwhelming number of canid skulls in Entierro 3, the overall age distribution results in the highest percentage of adults (39%), followed by juveniles (32%) (Table 5.5).

Table 5.5 Canid age distribution (MNI and percent) for all offerings.

	Ent 2 (n=1)		Ent 6 (n=10)		Ent 3 (n=17)		Ent 5 (n=2)		OF2 (n=1)		Total	
	MNI	%	MNI	%	MNI	%	MNI	%	MNI	%	MNI	%
Infant/Juvenile	0	0	0	0	0	0	0	0	1	100	1	3
Juvenile	1	100	6	60	1	6	2	100	0	0	10	32
Juvenile/adult	0	0	0	0	4	24	0	0	0	0	4	13
Young Adult	0	0	2	20	2	12	0	0	0	0	4	13
Adult	0	0	2	20	10	59	0	0	0	0	12	39
Total	*1*		*10*		*17*		*2*		*1*		*31*	

It is interesting to compare this find to other cases in highland Mexico. Canids excavated at the FSP were all young individuals before they reached one year of age, possibly not even 7 months old. Most of the canids utilized in sacrifice and as ritual paraphernalia in highland Mexico were composed of young individuals—out of 32 cases examined by Valadez, et al. (2002) only four were more than three years old. The designation of such high frequency of adult canids from Entierro 3 is noticeable.

Moon Pyramid: Entierro 2

Only one complete canid was excavated in Entierro 2, and there were no secondary deposits of canids. On the southern sector of the offering, in opposition to the two caged pumas, a wolf was excavated inside of a wooden cage (Elemento 213). This canid lay in a north-south orientation with its head to the south. This is the only complete well preserved canid permitting an almost full reconstruction of the entire skeleton. Even the *os pubis* bone was recovered from this skeleton, confirming that this individual was a male. All the teeth were permanent, but all the sutures on the head and long bone were not fused, suggesting this individual was a juvenile, between six to nine months old.

Two lagamorphs (rabbits and hares) were consumed by this animal prior to its sacrifice, one was identified as *Lepus* sp. and another *Sylvilagus* sp. Interestingly, some of the bones showed discoloration due to burning. Like other burnt bones in the abdominal cavity, they provide direct evidence of artificial breeding.

Moon Pyramid: Entierro 6

Only one complete canid was identified even though primary deposits of other species were abundant in this offering chamber. This canid, Elemento 2199, was excavated at the south-west corner of the dedicatory cache where there was a high concentration of primary deposits. Unfortunately, all the faunal remains in this section were very badly preserved, making it impossible to restore the skeleton. In fact, this individual was excavated in blocks as all the bones were plastered in an almost powdered state. This canid was deposited on its side with its extremities bound. At first, this individual was identified as a wolf-dog hybrid. However, the length and width measurements of the maxillary Pm3 and Pm4 do not confirm this identification (Blanco Padilla, et al. 2009; Valadez Azúa, et al. 2006). Thus, until further analysis, this canid is considered as a possible wolf. This female had a complete set of permanent dentition with unfused long bones, which led to its identification as a juvenile. No information about the surface modifications can be gathered due to the extremely degraded condition of the faunal remains.

In addition, nine skulls, some with associated phalanges and claws, were deposited throughout the offering cache. The only coyote identified from offertory contexts at Teotihuacan was found here, Elemento 1959, which was placed along the southern wall of the chamber. Another skull, Elemento 2229, was initially identified as a hybrid, *Canis lupus-familiaris*, but again their tooth measurements did not concur with this identification and is currently labeled as a possible wolf until further analysis.

Moon Pyramid: Entierro 3

Entierro 3 contained the largest MNI count by far, totaling 17 prepared cranial heads that were deposited throughout the offertory chamber. This MNI count is based on overlap analysis of cranial teeth, as these elements were highly fragmentary and many times they were the only bones reconstructed. This was the minimum count, and the presence of 18 Elemento numbers (see Table 5.4) begs the question if there were originally 18 canids represented in this chamber. Certainly, the presence of 18 eagles in Entierro 6, nine (half of 18) eagles in Entierro 2, and many other instances of this number showing up in offertory deposits all demonstrate that there is a high possibility there were 18, not 17, canid heads deposited in Entierro 3 because it was a highly significant number in Mesoamerican cosmologies.

Moon Pyramid: Entierro 5

A MNI of two individuals were identified in Entierro 5. One was a complete skeleton (Elemento 1636.2) while the second was represented by the crania and its mandible (Elemento 1508). In addition two distinct Elemento numbers were assigned to isolated claws and phalanges, but were not counted in the MNI totals. Elemento 1636.2 was sacrificed in the northern sector of Entierro 5, placed on its side next to the human burial 5-C, the northern most sacrificial victim in this chamber. This individual, like the rest of the faunal remains from this offertory cache, was highly fragmented and poorly preserved, making any reconstruction of the skeleton impossible. The only information gathered was that it was juvenile, between six to nine months of age and male. The sex of the animal was clear due to the presence of the *os penis* bone.

Apart from this complete skeleton, a wolf cranium was excavated. Although this animals was originally labeled as a hybrid between a wolf and a dog, the teeth measurements did not confirm this identification and thus was labeled as a possible wolf.

Sun Pyramid: Ofrenda 2

Only one canid cranium and mandible was interred in Ofrenda 2. This individual was the youngest canid found from all offering contexts thus far, identified as being between four to five months old based on the presence of deciduous teeth. Only its incisors were erupted (except the maxillary I3), and the rest of the permanent dentition was still being formed or in the process of erupting at the time of death.

Eagles

Eagles were one of the most abundant animals sacrificed in offertory complexes, totaling 29 skeletons, most of them primary burials (n=23) (Table 5.6, Appendix F). The majority of the eagles concentrated in Entierros 2 and 6, which constitutes some of the most convincing evidence of mass faunal sacrifice from any singular context at Teotihuacan.

Eagles were mostly found complete, although some exhibited post-mortem modifications implying they were secondarily placed into the offering cache. Nonetheless, there were high concentrations of complete or at least complete-looking eagles placed into Entierros 6 (n=18) and 2 (n=9). This pattern contrasts significantly to the scarce presence of eagles in Entierro 5 (n=1) and the absence of their remains in Entierro 3. At the Sun Pyramid, the only the eagle was interred complete. Although it was a singular specimen, in this offering the eagle played a prominent role as the only sacrificial victim.

Table 5.6 Summary of eagle skeletal remains from all offerings.

Elemento #	Primary	Complete	Age	Sex	Path	Surface	Stom	Notes
Ent.2								
81.1	Yes	Yes	Juv?	UnID	Yes	No	Yes	Right tibiotarsus, diafisis healed fracture.
120	Yes	Yes	Juv?	M	Yes	No	No	Pathology on proximal left fibula (infection/fracture?).
121	Yes	Yes	Juv?	M	No	No	No	
144	Yes	Yes	Adult	F?	No	No	No	
150	No	No	UnID	UnID	No	No	No	Claws of digit I or II of an eagle from nearby individual.
165.1	Yes	Yes	Young adult?	F?	No	No	No	
191	Yes	Probably	Adult	UnID	Yes	No	No	Osteroporosis on ulna of both sides.
196	Yes	Yes	Adult	F	No	No	No	
209	No	No	UnID	UnID	No	No	No	Only left ulna and radius, probably part of Element 120.
283.1	Yes	Yes	Infant/Juv	UnID	No	No	Yes	
309.1	Yes	Yes	Adult	F	No	No	Yes	
Ent. 6								
1888	Yes	Yes	UnID	F	Yes	No	No	Pathology on digit I, phalange 1.
1961.1	Yes	Yes	UnID	F	Yes	No	Yes	Pathology on left tarsometatarsus.
1962	Yes	Yes	UnID	UnID	No	Yes	No	Cutmarks on left tibiotarsus distal articular suface.
1983	No	Yes	Adult	M	No	Yes	No	Cutmarks on various extremeties, fracture on head.
2010	No	Yes	UnID	M	No	Yes	No	Cutmarks on head, mandible and left humerus.
2047	No	No	Adult	F	No	Yes	No	Cutmark on head, red pigment on bones.
2069.1	Yes	Yes	UnID	M	Yes	No	Yes	Pathology on tarsometatarsus.
2070	Yes	Yes	Adult	M	Yes	No	No	Pathology on the left humerus, radius, ulna, and femur.
2192	Yes	Yes	UnID	UnID	No	No	No	
2193	No	No	UnID	M	No	Yes	No	Cut along head, axial skeleton extracted.
2200	Yes	Yes	Adult	F?	No	No	No	
2214, 1919	Yes	Yes	Adult	M	No	No	No	
2222	No	No	UnID	UnID	No	No	No	
2225.1	No	No	Adult	UnID	No	No	No	
2226	Yes	Yes	Adult	F	Possibly	No	No	Possible pathology on right femur.
2239	No	No	Adult	F	No	Yes	No	Left tarsometatarsus and humerus.
2246	No	Yes	Adult	M	Yes	Yes	No	Pathology on both TM and L humerus. Cutmarks/perforations on head, L coracoid, femurs, and L tibiotarsus.
2261	No	No	UnID	UnID	No	No	No	
Ent.5								
1638.1	Yes?	Yes	Adult	UnID	No	No	No	Treated as primary burial although element distribution is not complete.
PPS Of 2								
211.1	Yes	Yes	Adult	M	No	No	Yes	

Table 5.7 Tarsometatarsus greatest length and proximal width of eagles from all offerings. Initial versus final sex identification based on McKusicK (2001).

Element #	Initial Sex ID	Final Sex ID	TM Length	TM Prox Width
Burial 2				
120	TF?	M	94.7	19.7
121	TM?	M	98	21
144	TF	UnID	98.5	-
165.1	TF	UnID	100.5	-
196	TF	F	105	25
283.1	TF?	UnID	87.6	23.01
309.1	TF?	F	99.25	23.55
Burial 6				
1961.1	TF?	F	106.5	23.15
1962	UnID	UnID	104	-
1983	TM?	M	98.8	20.56
2010	UnID	M	101.5	21.1
2047	TF	UnID	102.6	-
2069.1	TF?	M	99.5	21.33
2070	UnID	M	96.4	21.7
2192	UnID	UnID	102.4	-
2193	UnID	M	102.4	21.07
2200	TF?	UnID	99.7	-
2214, 1919	TF	M	100.35	20.975
2226	UnID	F	99.5	23.6
2239	UnID	F	104.5	23.3
2246	UnID	UnID	98.6	22
PPS-OF 2				
211.1	TF?	M	94.25	20.9

As explained in the previous chapter, identifying the age and sex of eagle skeletons was difficult. The sex of the animal was differentiated using tarsometatarsus length and width measurements of 51 female and 34 male skeletons from modern collection taken by McKusick (2001:Table 9). McKusick's measurements demonstrated that male tarsometatarsus mean measured 98.6 mm (SD 2.16) long by 20.7 mm (SD 0.8) wide while females were 101.5 mm (SD 2.55) long and 23 mm (SD 0.65) wide (Appendix C). Based on these finds, tarsometatarsus length and width of Moon Pyramid and Sun Pyramid eagles (Table 5.7) were plotted into a graph to accurately distinguish their sex once adult stature was reached (Figure 5.10). Based on this five female and nine male eagles were identified. Other indicators of sex, such as the morphology

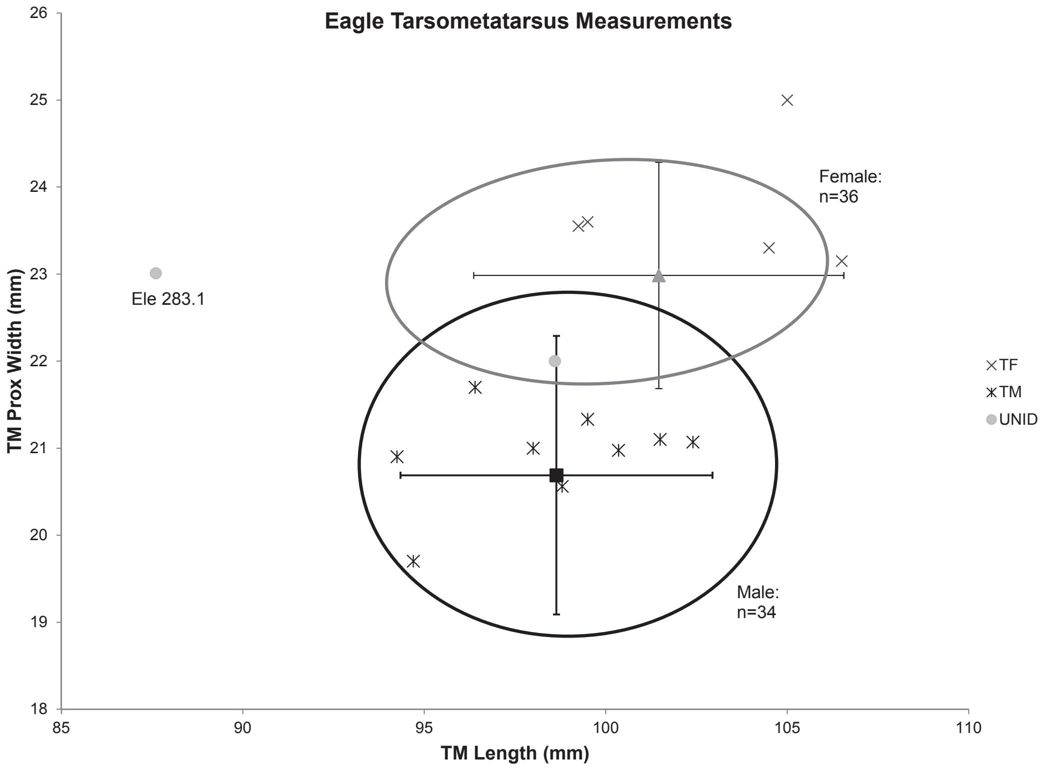


Figure 5.10 Eagle tarsometatarsus greatest length and width distribution of Teotihuacan female (TF), male (TM) and unidentified (UNID) specimens in comparison to McKusick (2001). Error bars from centroid (mean) represent 2 standard diviations, circular outline denotes the actual distribution for male (black) and female (grey). One outlier, Elemento 283.1 is of a juvenile specimen.

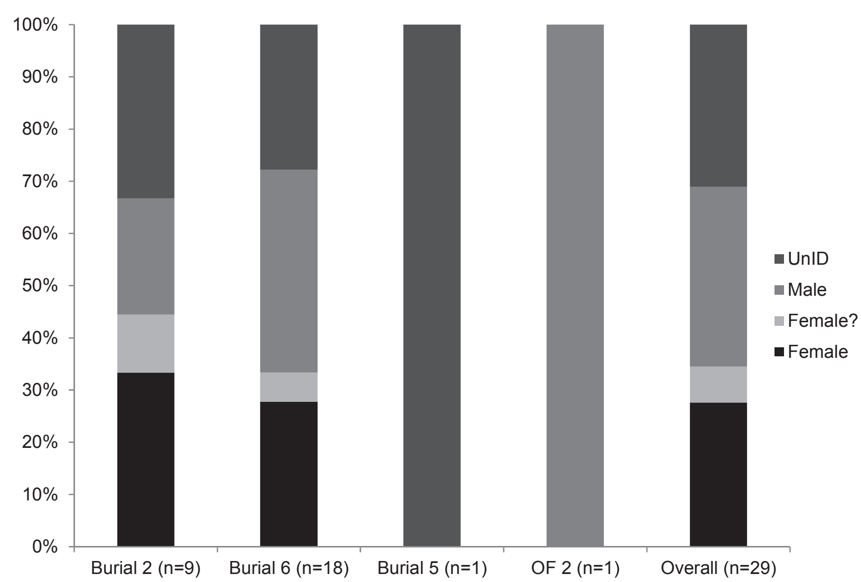


Figure 5.11 Sex distribution of eagles for each offering.

of the tarsometatarsus, especially in the muscle markings and robustness of this bone were utilized when bone measurements were not obtained.

Overall male and female distribution was fairly equal throughout the different contexts with ten males and ten females (possible females included). Entierro 2 contained a few more females than males while it was fairly divided in the case of Entierro 6 (Figure 5.11). The one individual found in Entierro 5 was not sexed and the only eagle deposited in Ofrenda 2 of the Sun Pyramid was identified as a male.

Eagle skeletons reach adult size very rapidly, growing to their complete adult size by 10 to 12 weeks of age (Watson 2010:207) around the time that eagles complete their nestling period. This was probably why the majority of the skeletons found in the offering were of adult stature — however, this does not necessarily mean the raptors had reached sexual maturity (at five to six years of age). Younger individuals were only discovered in Entierro 2 and are discussed in further detail. Again, I stress that the high frequency of individuals identified as adult in stature across offering contexts does not necessarily mean they were all mature adults. In fact the high frequency of infant, juvenile and young adults among other species suggests that younger individuals would have been easier to tame, maintain and would have been optimal for use in sacrificial rituals. Ethnographic accounts record birds sacrificed upon reaching prime plumage at around a year of age (McKusick 2001). Thus this age distribution was probably a mere consequence of the difficulties in distinguishing younger eagles from mature adults.

Moon Pyramid: Entierro 2

All eagles deposited in Entierro 2 were primary deposits. The only exceptions were Elemento 209 that was composed of just the left ulna and radius and Elemento 150 which included a claw from digit I or II. As the only eagle missing the two wing elements was Elemento 120, the bones of Elemento 209 were probably from this raptor. Several eagles did not have a complete set of claws, suggesting that Elemento 150 pertains to another nearby bird. Therefore, although there were eleven Elemento numbers assigned to eagles, the MNI count totaled nine.

Materials from Entierro 2 tended to be fairly well preserved, allowing for complete reconstruction and recording of surface modifications. Despite careful examination no significant surface features alluding to the cause of death were identified. This evidence further strengthens the argument that these individuals represent complete individuals sacrificed *in situ*. On site drawings and photographs recorded body orientation and manner of deposition; most raptors were deposited almost in bundle form, with their wings and feet joined. Obviously any restrictive device would not preserve, but the presence of caged animals from this same context further strengthens the argument that live animals were present in the dedicatory chamber.

Entierro 2 was the only context with young eagles. In most cases the thin interorbital tissue was completely destroyed, making it impossible to utilize interorbital fenestra closure as a useful indicator for age. However, Elemento 165.1 still maintained a small fragment with evidence for the presence of this opening, resulting in its designation as a young adult. This individual also contained a right innominate of a small mammal, perhaps a rodent that was probably in its stomach.

One individual, Elemento 283.1, was identified as an infant or juvenile. The tarsometatarsus measurements had the breadth of an adult specimen but had not reached its full length (Figure 5.10), suggesting that the individual was fairly young, probably around a month and a half to two months of age. At this age, the eagle would still be nesting, which indicates it must have been caught directly from the nest. This individual was a complete primary deposit that included a rabbit in its digestive tract. The stomach contents contained various cranial and post-cranial fragments, some of which had evidence of burning. Such remains, again, confirm the presence of artificial feeding of these specialized carnivores.

A few eagles from this context also exhibited pathologies indicating trauma and nutritional deficiencies. These markers were utilized to argue these raptors were kept in captive management. Elemento 81.1, a possible juvenile identified by the general smaller size of the skeleton, exhibited a pathology. This individual’s right tibiotarsus bone was difficult to reconstruct, mainly because the thinned remodeled bone probably made it more susceptible to brakeage. Nonetheless, enough of the bone was present to recognize the deformity, with new woven bone deposited along the distal shaft (Figure 5.12). This was probably the result of a healed fracture that would have been a painful injury. This wound would have affected this carnivorous hunter as the disabled leg would have made it difficult to catch prey.

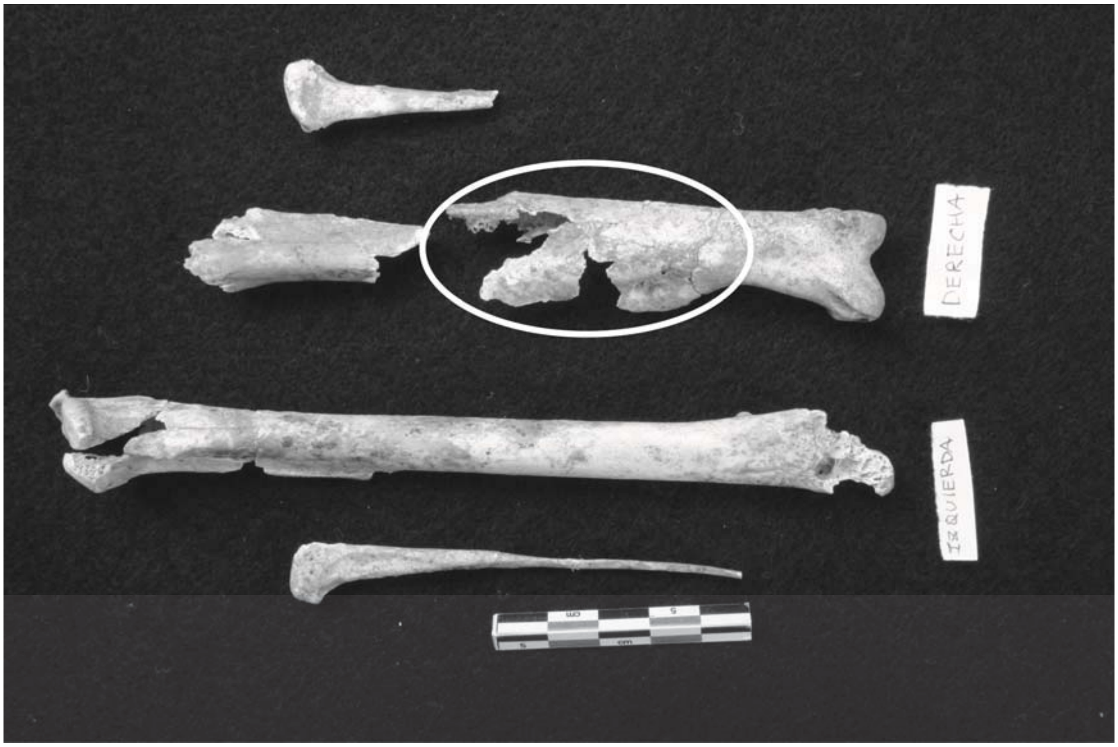


Figure 5.12 Tibiotarsus bone of an eagle (Elemento 81.1) with a pathology (circle).

Undoubtedly, this individual survived the wound, recovering rapidly as birds generally have faster healing capability as it produces large amounts of callus (Serjeantson 2009:56-58).

This eagle, like many others, consumed a rabbit prior to its sacrifice. Two hind limb chunks were probably fed, as only posterior limb bones were found in the stomach. Gastric etching on these bones confirms they were in the stomach and not merely found associated with the animal. Fragments of a small avian species and a left ulna of a *Buteo* sp. were also mixed in with these bones. It is possible that the eagle consumed a wing of this hawk. However, because they represent part of the wing where many of the precious feathers of this raptor attaches and because other *Buteo* sp. bones have been identified as part of the offertory remains from the same offering, I speculate the hawk's wing bones were accidently mixed into the same bag due to its proximity to the eagle skeleton.

Another individual, Elemento 120, further added to the evidence of injured raptors. This eagle was identified as a male and a possible juvenile due to its smaller size. Its left fibula on the proximal shaft presented bone remodeling, possibly from a fracture or infection along this point. This portion of the eagle is bare, with only small tarsi-feathers and any injury can quickly infect the bones. The thin fibula in particular can easily be fractured and would have been a possible method for constraining the animal's movement, particularly its claws that are very dangerous.

Captive behavior can also be detected by the overall health and nutrition of the animal. One effect of being confined to a pen and a radical shift in its diet is the thinning of bone or osteoporosis caused by either vitamin D deficiency and/or a nutritional strain. This was recorded on Elemento 191, whose ulna on both wings demonstrated considerable thinning. The ulna being one of the winged elements with major feather attachments, it is possible that this stress was compounded if their highly praised feathers were routinely plucked, which may have caused the recorded pathological anomaly.

Several raptors consumed aliments prior to their sacrifice. In total three individuals had rabbits and sometimes other small mammal or avian remains in their stomach. This is a pattern found not only among the raptors from this context, but also among the mammalian species sacrificed (see discussion in stomach content section). Interestingly, many of the same characteristics that demonstrate some of the eagles from Entierro 2 were kept in captivity were present among the eagles deposited in Entierro 6.

Moon Pyramid: Entierro 6

Eagles from Entierro 6 were found in two ways, either as complete primary burials or as secondary burials consisting of either fairly complete looking specimens, or just their extremities. Combined with the issue of preservation, distinguishing between the two types of deposition was not always apparent. Primary burials sometimes were badly preserved and many of the secondary burials looked fairly complete, but had fatal wounds and evidence for modification. Many raptors that were initially identified as complete primary burials were thus re-assessed upon more careful revision. This evidence suggests that along with live eagles, there were raptors that underwent extensive preparation as feathers or meat were extracted post-mortem. In some cases, raptors were intentionally prepared to look complete, possibly even prepared by taxidermists. Due to this unclear boundary, in this section I discuss the results of all eagle remains including secondary deposits; particularly because both types of deposition had the same surface modifications. In so doing, I argue that these secondary burials underwent the same ritualization process as the live eagles participating in the state spectacle.

There is no discernible patterning where the complete versus secondary eagles were placed in this chamber, but half were complete while the other half was not (nine individuals each) (Table 5.6). There is, however, an apparent focus on complete individuals found on the southwestern corner of the offering chamber, not only of eagles, but of canids and felids deposited superimposed similar to the mound of human sacrificial victims piled in the northwestern corner of the same cache. The ratio of male to female eagles in this context was fairly equal, with seven males and six possible females identified out of the eighteen individuals deposited.

Unlike Entierro 2, none of the raptors were distinguished as non-adult in stature. Due to the rapid growth of the raptor, reaching adult size fairly quickly, this simply means all the individuals where age could be identified were over three months old. This is not surprising, as there is only a short window of opportunity that the ritual would have to take place to include young statured raptors. Thus, no direct indicator of the season in which the ritual took place was gathered.

Turning to information concerning the individual life histories of the raptors, eagle skeletons were highly variable; some individuals contained pathological indicators of being kept in captivity, others had varying quantities of cut marks and other indications of manipulation of the corpse, and some individuals contained stomach contents. This variation most certainly originates from the mere large number of individuals that were deposited in this one context, eighteen in total, which is not an easy feat to accomplish. Here several examples are presented reconstructing how each eagle may have been kept and modified, prior to its final deposition into the offertory chamber.

Primary Burials

Nine of the eagles found in this context were assigned as complete, primary burials. Most of these eagles were positioned on their side superimposed extremities, as if they were bound to restrict movement. Like the felids, multiple eagles (n=5) displayed pathological indicators of stress and disease that led to the interpretation that these eagles may have also been kept in confinement for prolonged periods of time.

Three of the eagles, for example, demonstrate deformation on the medial side of their tarsometatarsus bone, which is their leg bone. For example, Elemento 2069.1 (Figure 5.13a) illustrated

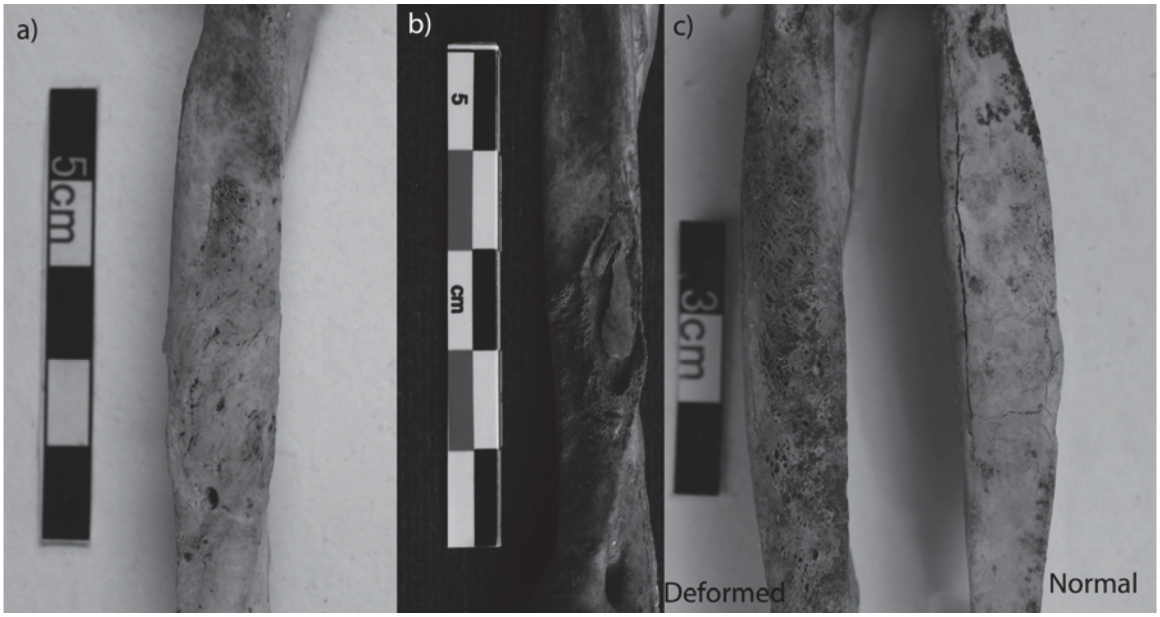


Figure 5.13 Medial view of eagle tarsometatarsus bones with pathological deformation, a) Elemento 2069 left side, b) Elemento 2246 right side, and c) Elemento 1961 right side.

this anomaly on its left limb that looks like an infection that caused the smooth and straight surface of the bone to become rounded, porous and inflated. The rest of the skeleton did not contain any other abnormalities. Associated with this individual the remains of an eastern cottontail represented by sections of the two hind limbs were discovered in the abdominal cavity.

Interestingly, Elemento 1961.1 displays a similar deformity on the left tarsometatarsus bone (Figure 5.13c). Like Elemento 2069.1, this eagle also consumed a rabbit, this time a desert cottontail, including its forelimbs, part of the vertebra, and the cranium. As the third raptor presenting this same pathology was not of a primary burial, its life history is discussed in the subsequent section (Elemento 2246, Figure 5.13b). Here I only highlight the similarity in the pathology and stress that the source of this infection was the same in both types of deposition.

A possible explanation for this pathological marker is that repetitive and long term friction along the medial shaft of the leg was caused by being tethered during confinement. Modern zoological literature support this hypothesis, as American kestrels (*Falco sparverius*) fitted with standard jesses were reported to cause, "traumatic sloughing of the epidermal scales on the legs" (Brisbin and Wagner 1970:29). Even when switching to leather jesses on screech owls (*Otus asio*), the tarsi-feathers were removed from the constant friction (Brisbin and Wagner 1970:29). Golden eagles also contain small tarsi-feathers and would have complicated any injury/infection as the feathers would have clotted the blood from the cutting and abrasion. While the method of captivity for the eagle population at Teotihuacan is not understood ethonohistorical records suggest it is likely they would have been tethered to perches (see Chapter 9), a pattern that is supported by the present pathological indicators.

The most dangerous weapon of an eagle were their talons, and perhaps this is why another pathology was recorded on a phalange of Elemento 1888, a female eagle placed on the southwest corner of the offering chamber (Figure 5.14). Only part of the eagle's skeleton preserved but a pathology was recorded on the left proximal phalange on digit one. In addition, the talon on this digit is missing. The presence of all the other phalanges and talons on both sides, including some of the smaller bones like its fourth digit, suggests that this claw was absent. If the pathology was the result of an injury on just the proximal phalange, the talon would have fused to the phalange. To the contrary, its absence suggests that the claw of the first digit, obviously the most dangerous talon, was chopped off, affecting the distal articular end of the proximal phalange. Such an interpretation strengthens the observations made on other raptors that they came into close contact with humans during their capture and confinement.

Another abnormality was observed on the left wing of Elemento 2070, interpreted as an infectious disease on its wing. The left humerus contained a spiral fracture that ran along the shaft where considerable thinning was observed (Figure 5.15a). At first, due to the spiral fracture, it was assumed it was caused by taphonomical processes, but the radius and ulna also exhibited similar pathologies suggesting that portions of the left wing were affected by some undetermined infectious disease (Figure 5.15b). A fragment of the proximal shaft of the radius was covered with new woven bone and pus, causing a lumpy surface. Unfortunately the proximal end of the corresponding ulna could not be reconstructed, but the fragmented shaft had areas with new woven bone. Most likely, the infected area was thinned and corroded new woven bone that is much more susceptible to the harsh taphonomical condition of the burial environment resulted in its absence. An infectious disease probably affected the left humerus and proximal lower wing elements. It is difficult to determine the cause of this pathological

Figure 5.14 Proximal phalange, digit I, left side of Elemento 1888 with pathology.

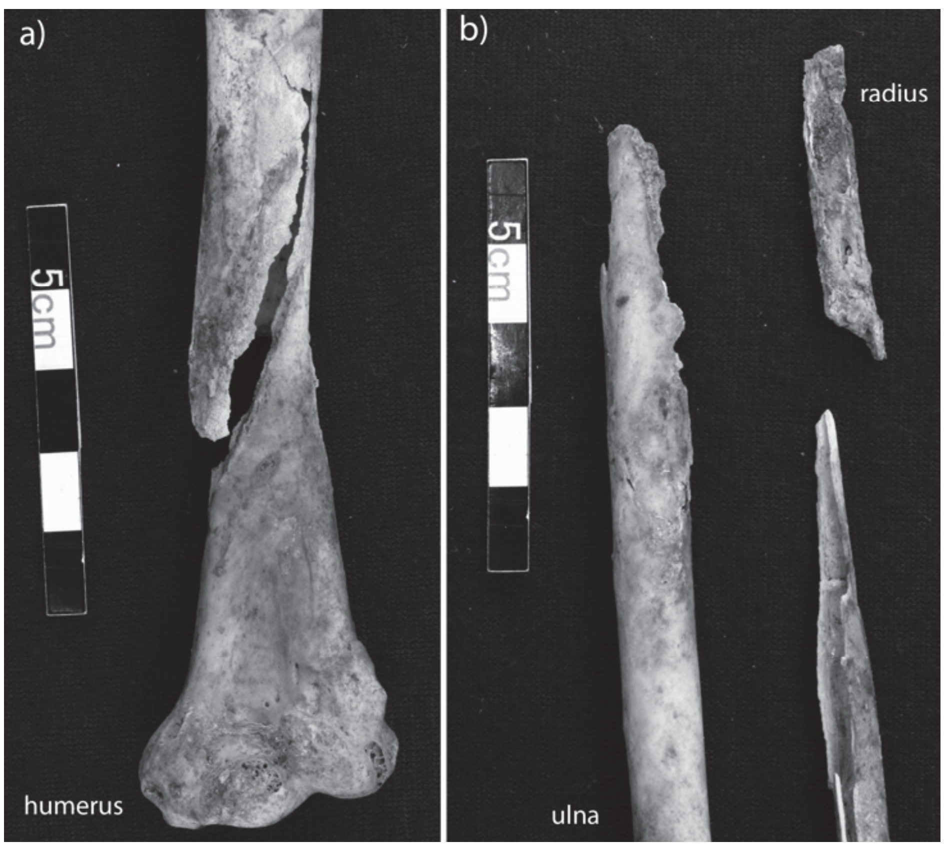


Figure 5.15 Left wing of Elemento 2070 with pathologies of infectious disease; a) humerus with thinning around spiral fracture; b) ulna and radius with similar pathology and in the case of the proximal shaft of the radius, pus and remodeling.

pattern but we can assume captive behavior increases the probability of infectious disease due to alimental and nutritional stress, debilities caused by feather plucking, vitamin D deficiency, and stress pattern but we can assume captive behavior increases the probability of infectious disease due to alimental and nutritional stress, debilities caused by feather plucking, vitamin D deficiency, and stress from restricted movements. In such a scenario the wings would be most susceptible to disease due to feather plucking, causing extensive energetic strain, and because they were probably restricted from flight.

The last example of a possible pathology on the skeleton resembles that described above for Elemento 2070, but is exhibited on the right femur of Elemento 2226. Its femur clearly demonstrates discoloration and thinning on the articular shaft of both ends. This type of discoloration and thinning may be the result of taphonomical processes, possibly differential humidity or exposure. However, due to the similarity observed with the Elemento 2070, it is possible that this anomaly indicates a pathology, possibly an infectious disease that particularly affects the joints.

In one case, deep cut marks on the edges of the distal articular surface of both tibiotarsus were identified on Elemento 1962 (Figure 5.16). Why these cuts were present is uncertain, but it is worth considering the anatomy of the eagle to interpret these modifications. The distal tibiotarsus is relatively bare, with hardly any meat, as the tarsometatarsus bone is covered only by epidermal scales. Some of the tarsi-feathers may be present, but these feathers could be plucked if necessary. A more likely scenario is that the articular surface was cut to injure one of the most dangerous weapon, the eagle’s long and strong talons. Cutting along the medial and lateral sides of the tibiotarsus through the tough tendons would make its hindlimbs immobile, and much easier to handle. The absence of any clear signs of remodeling around the cut marks suggests this was inflicted relatively close to the time of death, although it was probably not the cause of death.

While some individuals exhibited interesting surface modifications that recreated the complex life histories of the individuals, others were simply identified as primary deposits with no other information (Elementos 2192, 2200, and 2214-1919). These cases demonstrates that these eagles were of a “wild”

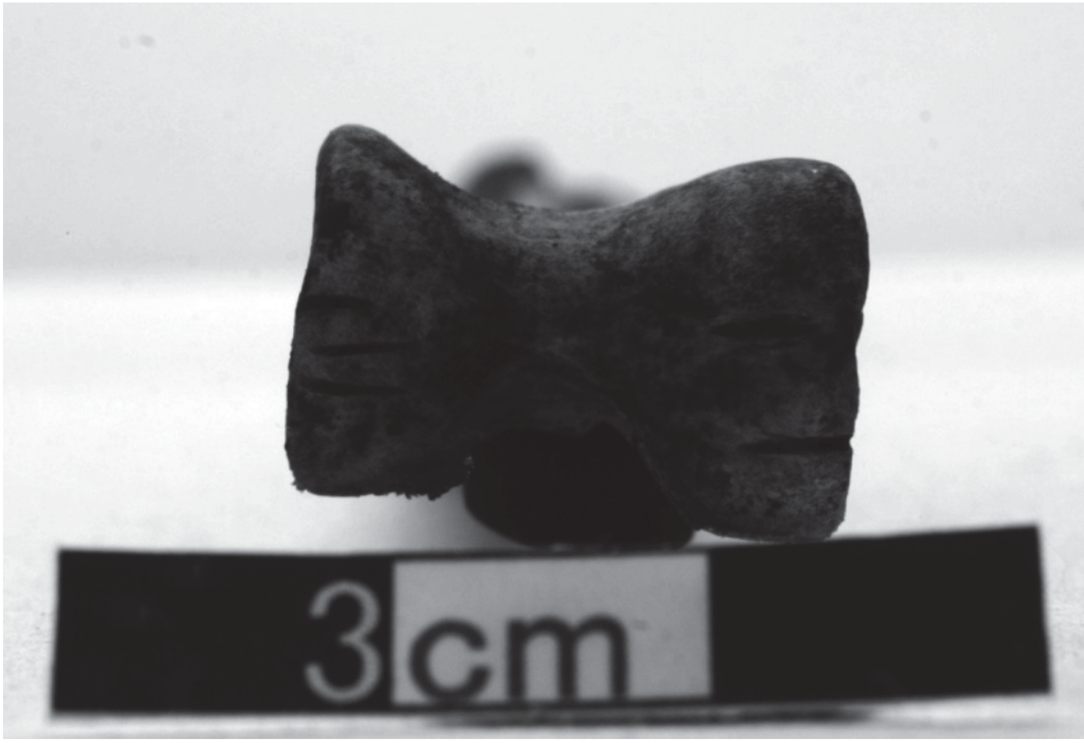


Figure 5.16 Distal articular surface of a left tibiotarsus of eagle (Elemento 1962) with deep cut marks.

population or their interactions with the Teotihuacanos did not affect the osseous remains. This is why skeletal isotopic data was used to supplement the pathological indicators of captivity.

Secondary Burials

Several individuals demonstrated extensive preparation procedures occurred prior to its deposition despite the fairly complete nature of the skeletal remains. Archaeological and modern collections were utilized as models to reconstruct manufacture procedures.

Cut marks indicate preparation strategies and several individuals exhibited various quantities of cut marks. For example, Elemento 2010 was a complete individual that on the offset looked like a primary burial. However, once the entire skeleton was reconstructed and careful examination of surface modifications was completed it became apparent that the raptor was deposited post-mortem. The most obvious marker was the large orifice found in the occipital region of the skull, no doubt to extract the soft tissue in the brain case (Figure 5.17). Other cut marks along the margins of the left orbital area, as well as on an accessory bone near the eye cavity demonstrate this area was probably also prepared to restrict

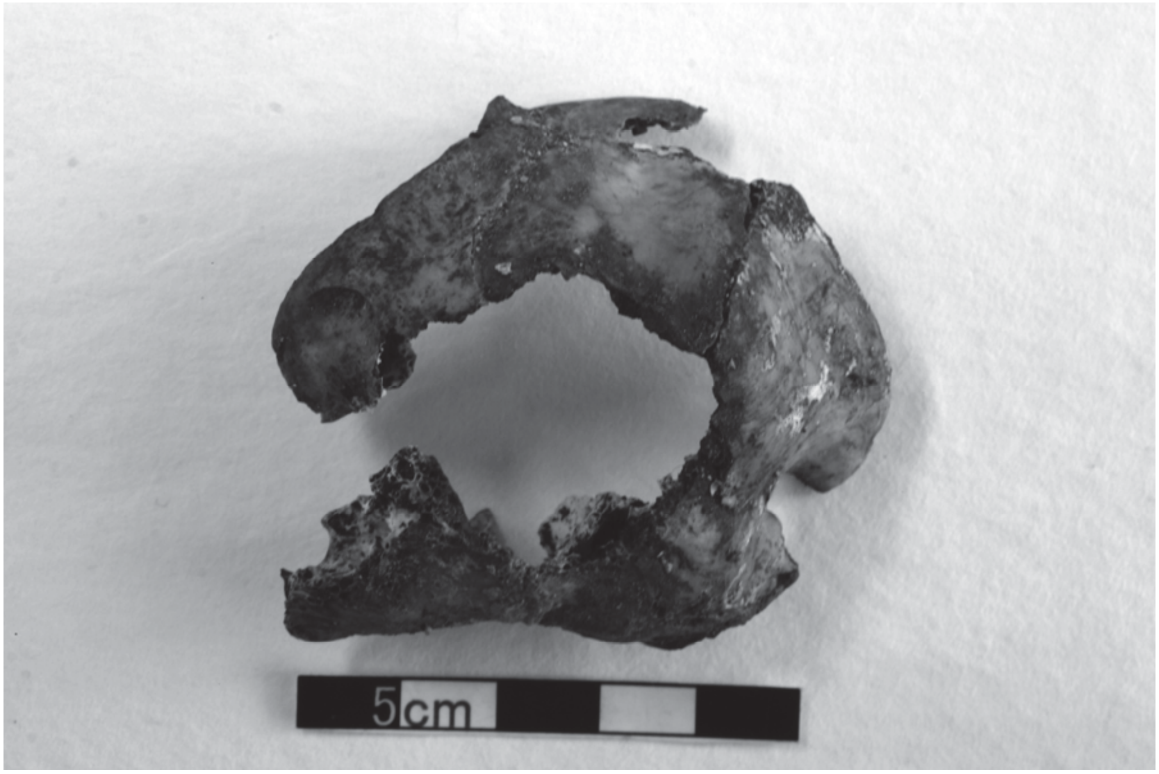


Figure 5.17 Dorsal view of the cranium of eagle (Elemento 2010) with large orifice in the occipital region.

rotting of soft tissue. The inferior side of the internal articular process also contained clear cut marks. On the left humerus very scant indications of cut marks were found along the proximal shaft. All the above information demonstrates that several elements were modified before the individual was deposited into the offertory chamber, particularly areas where soft tissue would have been extracted. Nonetheless, the complete and articulated layout of the skeleton suggests that once the soft tissue, meat and/or feathers were extracted, the skeleton was kept articulated for final deposition.

Many of the secondary burials lacked the neurocranium although there was variation in how much of the neurocranium was kept. Unlike Elemento 2010, Elemento 2047 contained less fragments associated with the neurocranium and was probably cut along the height of the parietal-frontal juncture. The only other cut marks examined from this individual were found on the proximal articular surface of the ulna, suggesting that cuts were inflicted on this juncture. Interestingly, some of the bones from this offering contained pigments adhered onto the bones, in this case on the right ulna, possibly because red pigment was sprinkled in this context.

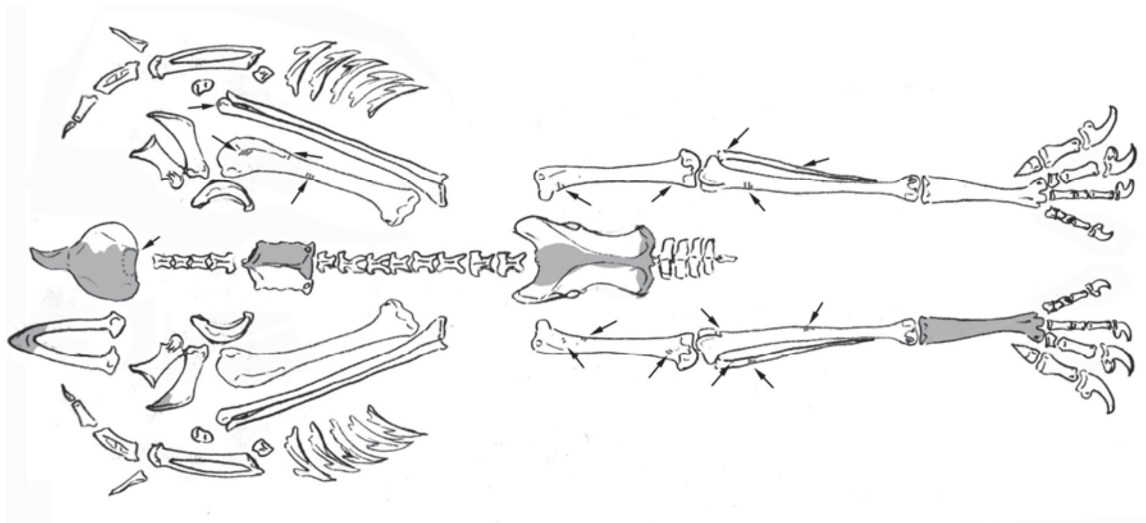


Figure 5.18 Element and cut mark distribution of eagle, Elemento 1983. Grey denotes areas absent/not reconstructed and arrows highlight areas with cultural modifications.

Another raptor had a distinct pattern with extensive cut marks throughout the corpse despite the complete nature of the skeleton. Elemento 1983, an adult male eagle was deposited in the southeast corner of the chamber. This individual contained extensive cut marks throughout its body despite the semi-complete skeleton (Figure 5.18). Beside extensive cut marks distributed throughout the skeleton, a large fracture on the skull confirmed the eagle was deposited post-mortem. Although the cranium was fragmentary and only the right occipital region could be reconstructed, it was possible to assess that a blow was inflicted to the back of the skull fracturing a semi-rectangular opening in this region.

Cut marks concentrated around the extremities, particularly the humerus, femur, tibiotarsus and fibula. They were found either along the diaphysis, especially along major muscle markings, and even along the mid shaft of the humerus and tibiotarsus. Repetitive cuts were inflicted horizontally, a motion that most resembles slicing the carnage off of the bone during butchering. Yet, none of the cut marks suggest the skeleton was disarticulated, as the articular surfaces had no cut marks. In fact, to the contrary, there is evidence that these bones were kept articulated. Not only was the skeleton found completely articulated, the distal end of the ulna contained a perforation, 1.6 mm in diameter, that suggest the wing was assembled to preserve articulation.

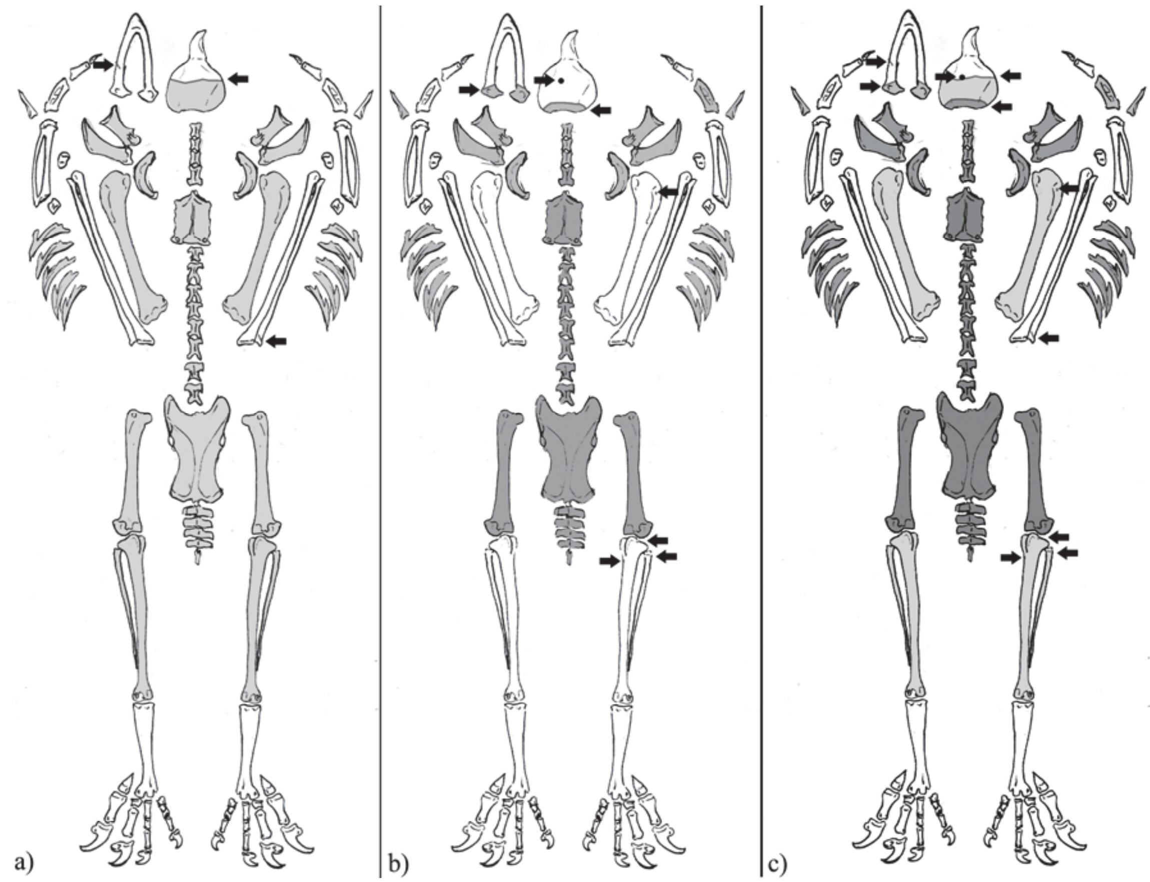


Figure 5.19 Element and cut mark distribution of eagles; a) Elemento 2193; b) modern comparative eagle prepared by taxidermist; c) overlap analysis of the two samples. Area in grey is absent, arrows highlight cultural modifications.

Another example of extensive preparation can be found on Elemento 2193, who was placed on the northeastern corner of the offering. This individual was represented only by the head, the wings and the hind limbs (Figure 5.19a). The distribution of the skeleton suggests that the axial skeleton and the shoulder girdle were extracted. Yet, the remaining bones were articulated, even the smaller phalanges and claws. The head demonstrated clear signs of modification, cutting transversally along the cranium detaching the braincase. A cut mark was also present on the left mandible of this same individual. In addition, a cut mark was recorded on the right radius just along the proximal shaft. Interestingly, this individual's element distribution strongly resembled modern taxidermic preparation produces.

As a comparison, the remains of a modern eagle, prepared by a taxidermist housed at the Paleozoological Laboratory in the Instituto de Investigaciones Antropológicas at the Universidad Nacional Autónoma de México was analyzed. Particularly, the element distribution and the locality and the type of surface modification were recorded. The axial skeleton (vertebrae, keel and synsacrum), the shoulder girdle (coracoids, scapula and furculum), ribcage, and upper hindlimb (femur) were absent (Figure 5.19b). These bones were removed during the extraction of the internal organs that was later stuffed, while the remaining bones provided skeletal integrity. This resulted with a similar element distribution to Element 2193 which leaves the cranium, wings and part of the hind limbs intact. Surface modifications present on this modern example included a large transversal cut along the occipital region that extended to the basioccipital region, a perforation on the superior surface of the skull, a cut on both sides of the mandible at the height of the angular area, a puncture on the humerus by the deltoid crest, a perforation on the proximal articular surface, a cut on the proximal head of the fibula, and cuts on both ulnas at the articular surfaces.

These characteristics were compared to the archaeological case of Elemento 2193 though overlap analysis (Figure 5.19c). Despite the variation in the degree to which the skeleton was prepared, several obvious similarities are present. Both preparation procedures resulted in the extraction of the axial skeleton, the ribs, the shoulder girdle, and part of the hindlimb (presence/absence of tibiotarsus and fibula varied). This was most likely conducted to extract the internal tissue and to discard the cerebral organs through either the removal of the entire braincase (Elemento 2193) or by extracting solely the occipital region (comparative sample).

As a third comparison, recent publications about the skeletons of golden eagles from Templo Mayor in the Aztec capital also support this hypothesis. The publication reports that the eagles found in Ofrenda 120 demonstrated evidence for taxidermal preparation techniques (Quezada Ramírez, et al. 2010). They describe how the extraction of various axial elements and the removal of the encephalic organs from the braincase. They identify five preparation styles, varying in retention of the pygostyle (tail bone) where the long tail feathers attach, the method of extracting the brain tissue (one variant is through expanding the foramen magnum), and the retention of the complete hind limb. Descriptions of these variations are similar to those identified between Elemento 2193 and the modern comparative specimen despite the disparate time frame between Teotihuacan, Aztec and modern taxidermic preparation methods.

Similar to Elemento 2193, Elemento 2239 only contained the wings and hind limbs. While it is tempting to argue that this individual was also taxidermically prepared, the skull of this animal was never found, and thus is likely that it would have composed of maybe the feathered cape or a more extensively prepared product. There were deep groves placed on the articular surface of the left tarsometatarsus bone, probably inflicted during the dismembering of the tibiotarsus-tarsometatarsus joint. On the distal shaft of the left humerus, a couple of cut marks were also identified, again probably etched during the dismemberment process.

A couple of the individuals had no surface modifications but were designated as secondary deposits because many body parts were absent. For example, Elemento 2222 only contained a few long bone fragments, probably because only the wings were deposited. Elemento 2225.1 were similarly composed of mainly the extremities, parts of the shoulder girdle and even some of the tail vertebrae including the pygostyle. Lacking the axial skeleton and the head, like Elemento 2239 this individual was probably a highly processed artifact, maybe a feathered cape. The pygostyle where the long tail feathers attach were retained indicating that the feathers were present when the bones were deposited. Similarly, Elemento 2261 located along the northern wall was designated as a secondary burial because only fragments of the right humerus, left ulna, femur (both sides), phalanges and talons were identified. With no surface modifications to aid interpretation, it is unknown if the bones were deposited as isolated elements into a pile, or if it was a prepared object.

One individual demonstrated the complexity of animal biographies. Elemento 2246 presented both pathologies that suggested captive behavior and exhibited surface modifications confirming that it was a secondary burial (Figure 5.20e). This male eagle had reached adult stature and was found deposited along the northern wall of the offering along the east-west axis. The skeleton presented a couple pathologies. Both tarsometatarsi had an infection that caused extensive bone remodeling along the medial shaft (Figure 5.13b). The distal end along the antepicondyle of the left humerus was also remodeled. The former pathology was interpreted as the consequence of a tethered lifestyle that led to the observed infection. The pathology identified on the humerus is more difficult to interpret, but is most likely due to

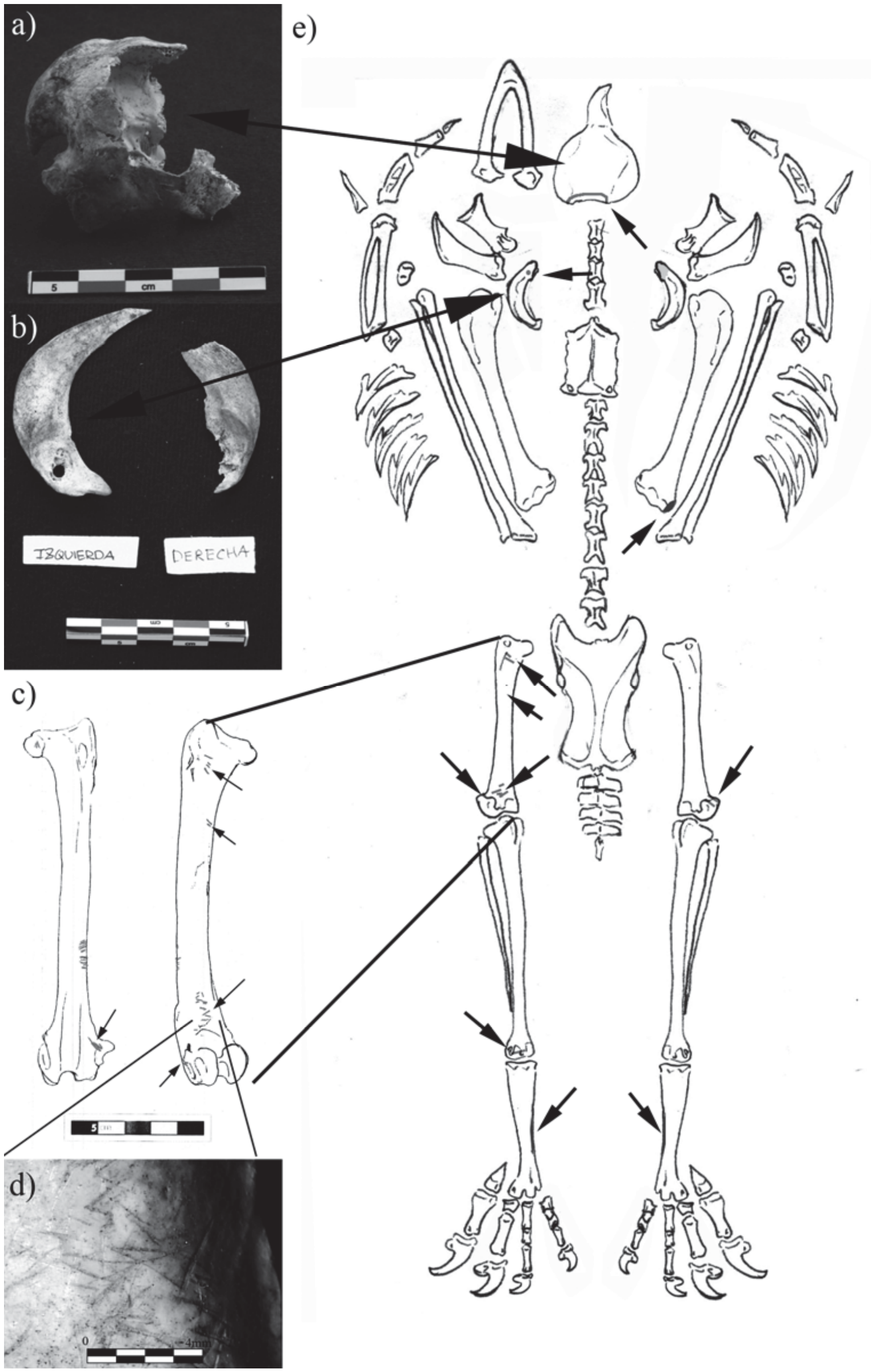


Figure 5.20 Eagle, Elemento 2246; a) dorsal view of the skull with large opening; b) furculum, left side with perforation; c) diagram of left femur, arrows denote cut marks, other grey areas represent presence of fibers; d) microscope image of cut marks on left femur, scale 4mm; e) distribution of cut marks (arrows), the skeleton was complete.

an injury/infection on the wing along this critical joint between the humerus and ulna. Such an injury, while not fatal, could have made flight a difficult task until it healed completely. Together, these two pathologies demonstrate that like some of the primary burials, this raptor was also kept in captivity for prolong periods.

While the individual looked like a complete primary burial during excavation, several surface modifications suggest otherwise. The cranium had an opening along the occipital region like many of the secondary deposits, suggesting the encephalic tissue was extracted during preparation (Figure 5.20a). Cut marks were also distributed throughout the skeleton including both femurs (Figure 5.20c,d) and the left tibiotarsus. These cuts were very lightly placed mostly along the shaft close to the epiphysis. A circular perforation was recorded on the left furculum on the scapular tuberosity (Figure 5.20b). Unfortunately the scapular tuberosity of the right fulcrum was fragmented, but both sides likely contained the same perforation. Most likely, both fulcrum were pierced to keep skeletal integrity at the shoulder girdle, making the individual intact and look complete during the dedicatory ritual. This individual may have also been wrapped, as various fibers were found adhered onto the skeleton including the keel, femur (both), left tibiotarsus, carpometacarpus (both), vertebras and mandible.

Moon Pyramid: Entierro 5

An adult-statured eagle (Elemento 1638) was deposited in this offering. This eagle was placed in-between two other animals; to the north of a complete puma (Elemento 1639) and to the west of a crow (Elemento 1637). This threesome was located to the west of the two human sacrificial victims. Unfortunately the bones suffered extreme taphonomical damage, resulting in highly fragmented bones that were both very brittle and warped, making it impossible to reconstruct. The bones that were identified included a significant portion of the hindlimb (fragments of the femur, tibiotarsus, tarsometatarsus, phalanges and talons), parts of the wing (ulna, radius and humerus), and fragments of the cranium and mandible. It is difficult to conclude from the fragmented, almost powder like pieces if the rest of the skeleton was not recognizable or simply missing. Judging from the extent of scatter for the bones in drawings and field photographs, it is most likely that this individual was a complete primary burial. Many of the complete animals tended to be associated with human skeletal remains, in this case the complete eagle and crow are associated with the individual 5-C, placed in between the two other sacrificial victims. Due to the extreme taphonomical damage mentioned above, it was impossible to extract any additional information concerning surface markings or pathologies.

Sun Pyramid: Ofrenda 2

The only complete eagle skeleton found in Ofrenda 2 was of an adult male placed on the southeastern corner. This individual was certainly a primary burial, as the consumed rabbit bones were found *in situ*. No surface modifications that could indicate cause of death or other manipulative process were found despite the very complete and well preserved skeleton. Some organic material was adhered onto the skeleton, which was found abundantly throughout the offering environment.

Two rabbits were consumed by this individual prior to its sacrifice; they were found in two different locations demonstrating that they were eaten at separate times. More detailed information about the rabbits is discussed later, but at this point I merely highlight that some of these bones demonstrated evidence of burning, again confirming the presence of artificial feeding.

Raven

Entierros 2 and 5 contained the remains of the common raven; of which only one from Entierro 5 was a primary burial. The semi-complete remains of the common raven (Elemento 1638) were found on the western sector of Entierro 5 immediately in front of a sacrificial victim. Unfortunately the degraded bones made it extremely difficult to reconstruct the entire skeleton, which was probably complete. Interestingly, this specimen demonstrated pathological indicators of a bone deformity, probably caused by an infectious disease. The left pollex on the wing was inflated from some sort of disease. In addition, some of the phalanges on the right and left hindlimbs were warping and showed excessive remodeling, possibly from an injury or infection (Figure 5.21). It is unclear what would cause such pathologies, but is certainly possible that it was the result of an infectious disease caught during confinement. Interestingly, two long bone fragments of a reptile, either *Anuro* sp. or lacertilian, were mixed in with this individual. It is uncertain if these were the remains of stomach content or just fill refuse.

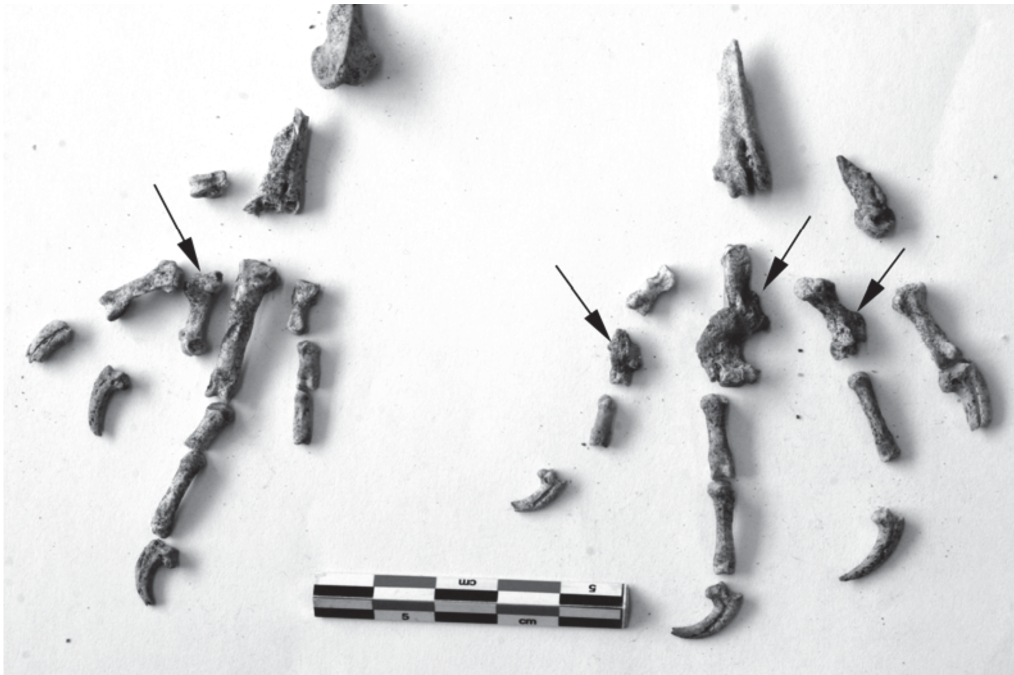


Figure 5.21 Feet of common raven, Elemento 1637. Arrows indicate location of pathologies.

Rattlesnakes

One of the most challenging animals to calculate MNI were the serpentine remains from Entierros 2, 6 and 5 (Table 5.8). Often deposited as a cluster, it was extremely difficult to distinguish one individual from the other. Furthermore, identifiable elements, such as cranial fragments, are often lacking from the archaeological record because serpents have a unique adaptation that allows them to dismount the jaw with never-fusing cranial elements, causing the small fragments to be destroyed or lost during archaeological excavations. Only the MNI count of the materials from Entierro 2 relied on the number of mandibles for this calculation, as the good preservation and meticulous excavation techniques were able to recover the remains of at least six pairs of mandibles. Vertebrae cannot be used for MNI calculations as they are abundant and vertebrae counts vary considerably by species and among individuals. MNI calculations for Entierros 6 and 5 were much more complex and the results reported in Table 5.1 should be considered as tentative estimates. Nonetheless, it is tempting to assign a symbolic significance to the number of serpents in Entierro 6 and 5 (18 and nine respectively).

There were at least two, maybe three species of rattlesnake represented in the offerings based on the clear differences in size and the morphology of the vertebrae. About five to six species of rattlesnake

Table 5.8 Summary of serpentine (rattlesnake) remains from all offerings.

Elemento #	MNI	Stom	Notes
Entierro 2			
252	6	No	MNI count based on the number of mandibles.
Entierro 6			
In Basket	18+	UnID	MNI count based on drawing from MRI images.
Entierro 5			
1021	1	No	Semi-complete indvidual.
1022	3	Yes	At least 3 individuals based on size difference, none are very complete. One had a rodent in stomach. One of these individuals corresponds to Ele 1507.
1037	1	No	One individual fairly complete including cranial elements.
1063	1	No	
1489	2	Yes	At least 2 indidivual based on size difference. One had a rodent in stomach. One of these individuals corresponds to Ele 1568 and 1569.
1494	1	Yes	Pathology of 2 dorsal vertebras are fused together. MNI of 2 rodents in the stomach.
1507	1	Yes	One rodent in stomach. Semi complete individual. Includes materials from Ele 1022.
1552	1	No	Not complete.
1568	1	No	Not complete. Parts of this indivdual in Ele 1489 and Ele 1569.
1569	1	No	Not complete. Parts of this indivdual in Ele 1489 and Ele 1568.

Notes: Som: Stomach content present?

inhabit the Mexican Basin (see Chapter 4), but species-level identification was impossible. It is necessary to develop a comparative morphometric measurement standard for serpent vertebrae to designate the species. A series of metric and morphometric traits were recorded for the archaeological collection following La Duke (1991), that will hopefully allow for this type of analysis in the future (Appendix G).

Determining the age and sex of these individuals was equally difficult, limited by the inability to distinguish between individuals, the specie and the ordering of the trunk. No evidence of the prebotton on the rattle, found among very young serpents, was identified. Its absence, however, could be the result of the poor preservation, and thus cannot indicate the lack of young serpents in the collection. Similarly, until species are distinguished, it is impossible to look for sexual dimorphism.

Some of the rattlesnakes had small rodent bones, particularly deer mouse (*Peromyscus* sp.) mixed with rib fragments, suggesting they were consumed. While larger lagamorph bones (mainly rabbits) were found in the stomach of the mammalian and avian individuals, rattlesnakes were fed rodents prior to their sacrifice.

Moon Pyramid: Entierro 2

Rattlesnakes were found concentrated near the center of the offering, just to the west of a large disk. The scattered vertebrate were excavated as one Elemento number, Elemento 252, and MNI calculations were assigned later in the lab. This calculation was based on the number of mandibles recovered from meticulous excavation techniques. Unfortunately no other information about the age or sex of the individuals could be identified at this point. It is interesting to note that while the serpent remains from Entierro 5 demonstrated clear evidence of two very distinct size classes of rattlesnake, probably because two species were utilized, most of the variation from Entierro 2 were minimal.

Moon Pyramid: Entierro 6

Near the center of Entierro 6, a round basket was discovered still intact with large concentric circles clearly defining the layers of woven fibers. This basket was excavated as a block *in situ* in effort to preserve this fragile find. It was only when a small subset of the vegetal material was sampled by paleobotanists that small vertebral and rib fragments were found in its interior. Once these vertebrae were

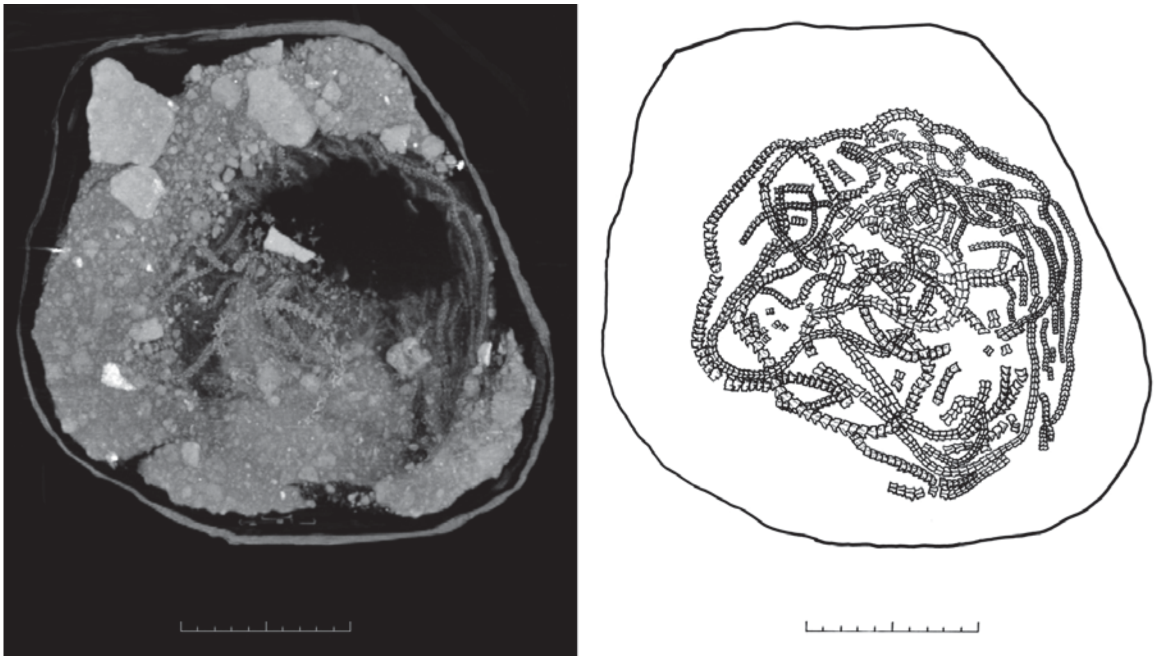


Figure 5.22 Archaeological basket with at least 18 serpents inside; MRI image (left) and line drawing based on MRI images (right). Scale bar for 10cm.

identified as rattlesnake, the entire block of the basket was taken in for MRI imaging. To our surprise, this basket was full of rattlesnake remains, with multiple serpents literary piled on top of each other (Figure 5.22). The identification of the few vertebrae samples as rattlesnake and the consistent morphology and size of the remains with the other serpentine materials found in Entierros 2 and 5 suggest these remains were also of rattlesnake. Based on the MRI image, a plan view drawing of these remains was completed.

Several attributes make the MNI estimates extremely difficult to calculate. The resolution of the MRI image was such that only well preserved vertebral columns were visible in between the fill matrix, and smaller elements such as ribs and particularly crania were impossible to distinguish from the surrounding dirt and fiber. Thus MNI calculations were based on reconstructing complete vertebral columns from the images and counting them. Various taphonomic processes, its archaeological excavation, and the removal of a paleobotanical sample misaligned various elements resulting in many incomplete vertebral columns and isolated elements. With the added complication due to the poor visibility of the MRI image, estimating the MNI from the plan view drawing proved to be difficult. Nonetheless, an MNI count of 18 is proposed, which is a conservative estimate as many of the loose vertebral sections left uncounted, and a more realistic estimate ranged between 16 to 22 individuals. Nonetheless, it is tempting to draw a parallel of the potential 18 serpentine remains to the 18 eccentric obsidian artifacts that radiate around a central disk just to the northwest of this basket and the 18 eagles.

Only limited zooarchaeological information was gathered from the visual analysis of the MRI images and the small number of vertebral remains extracted during paleobotanical sampling. Particularly, the MRI image could only define the central vertebral column due to the relatively high density of the dirt matrix that obscures any of the smaller bones such as ribs, crania and even smaller caudal vertebrae. This means that any small faunal elements, for example in the stomach content of the rattlesnake would not be visible. While we know rodents were consumed by some of the serpents deposited in Entierro 5, we cannot use the MRI image for this sort of analysis. Furthermore, any additional details like surface features (including pathologies) were impossible to discern from a mere visual analysis. Future analysis excavating a portion of the basket would help obtain more detailed information.

Moon Pyramid: Entierro 5

Serpent remains from Entierro 5 were recovered scattered throughout the chamber. Each concentration was given an Elemento number which should correspond to the number of individuals. However, on a couple of occasions the bones recovered resulted in more than one individual, in which case the location of the materials was examined for nearby Elemento numbers that may correspond to the same animal. For example, Elementos 1568 and 1569, each composed of only a handful of vertebrae, were counted as part of Elemento 1489. One of the two individuals identified as Elemento 1489, probably included the scattered remains of these two elements excavated immediately to the west. Similarly, it was determined that a few of the vertebrae of Elemento 1507 were mixed in with one of the three individuals identified in Elemento 1022. Once these adjustments were made, a total of nine serpents were accounted for in Entierro 5. Again, this number shows up repeatedly in the offerings and is no surprise here.

Small Mammals: Stomach Contents

Most of the small mammals were found in a specific context; as the stomach contents of the sacrificial carnivores. As the majority of the animals were found associated with the remains of the

Table 5.9 Summary of small animal (mammals and birds) remains from all offerings.

Elemento #	Specie	Age	Sex	Eaten by	Captive?	Surface	Notes
Entierro 2							
81.2	*Sylvilagus* sp.	Adult	UnID	Eagle	Yes	Gastric etching	Hind limbs only.
154.2	Leporidae	UnID	UnID	Puma	Yes	No	Materials mixed in with the coprolites of this animal. Included two teeth fragments and a phalange.
167.2	*Sylvilagus* sp.	Adult	UnID	?	No	No	Found with felid head Ele 167.1. Can either be from the fill matrix or part of eagle Ele 165.
213.2	*Lepus* sp.	Young adult	UnID	Wolf	Yes	Discolored and gastric etching	Possibly burnt. Scattered elements of entire body.
213.3	*Sylvilagus* sp.	Adult	UnID	Wolf	Yes	Burnt and gastric etching	Greater degree of gastric etching.
217	*Lepus* sp.	Adult	UnID	?	?	No	Isolated tibia found inside cage of wolf Ele 213.
283.2	*Sylvilagus* sp.	Adult	UnID	Eagle	No	Burnt	Scattered elements of entire body.
309.2	*S. floridanus*	Young adult	UnID	Eagle	No	Burnt and gastric etching	Scattered elements of entire body.
309.3	*S. audubonii*	Juvenile	UnID	Eagle	No	Gastric etching	Scattered elements of entire body.
165.1	*Microtus mexicanus*	Juvenile	UnID	Eagle	No	No	Isolated ilium, unsure if stomach content or fill material.
81.4	UnID small bird	No	No	Eagle	Yes	No	2 fragments of unidentified diafisis. Mixed with the stomach contents of an eagle with another rabbit.
283.3	UnID small bird	UnID	UnID	Eagle	No	No	2 cervical, 1 lumbar vertebra mixed in with the stomach contents of eagle.
218	UnID mammal	Inf/Juv	UnID	No	No	No	2 unfused thoracic vertebral fragments. From fill.

Table 5.9 Continued.

Elemento #	Specie	Age	Sex	Eaten by	Captive?	Surface	Notes
Entierro 6							
1818.2	*S. audubonii*	Infant	UnID	Puma	Yes	Burnt and gastric etching	Scattered elements of entire body. Also found another rabbit and bird in same stomach content.
1818.3	*S. audubonii*	Infant	UnID	Puma	Yes	Burnt and gastric etching	Scattered elements of entire body. Also found another rabbit and bird in same stomach content.
1961.2	*S. audubonii*	UnID	UnID	Eagle	Yes	No	Possibly cooked. Scattered elements of entire body.
1991.2	*Sylvilagus* sp.	Juvenile	UnID	Felis sp.	No	No	Mainly hind limb elements.
2069.2	*S. floridanus*	Adult	UnID	Eagle	Yes	No	Mainly hind limb elements.
1818.4	UnID small bird	UnID	UnID	Puma	Yes	No	2 frag. of isolated long bone fragments.
2207	*Sciurus aureogaster*	UnID	UnID	No	No	No	7 cranial fragments, 3rd metacarpus, 7 phalanges and two claws. Evidence of burning. From fill.
2077	UnID mammal	UnID	UnID	No	No	No	Spongy bone, unidentified medium mammal. From fill.
1982.3	UnID mammal	UnID	UnID	No	No	No	Sesamoid and spongy bone fragments. From fill.
Entierro 5							
E1S3.2	*Lepus* sp.	Adult	UnID	-	No	No	Metapodial fragment, probably mixed fill refuge.
1022.4	Rodentia	UnID	UnID	Serpent	No	No	Frag of skull, mandible and one long bone (humerus).
1489.2	*Peromyscus* sp.	UnID	UnID	Serpent	No	No	Cervical vert., pelvis and hindlimbs.
1494.2	*Peromyscus* sp.	UnID	UnID	Serpent	No	No	Scattered elements of entire body.
1494.3	*Peromyscus* sp.	UnID	UnID	Serpent	No	No	Cranium only.
1507.2	*Peromyscus* sp.	UnID	UnID	Serpent	No	No	Left tibia only.
PPS OF 2							
211.2	*Sylvilagus* sp.	Juvenile	UnID	Eagle	No	Burnt.	Scattered elements of entire body. Found in the lower ribcage/synsacrum area.
211.3	*Sylvilagus* sp.	Inf/Juv	UnID	Eagle	No	Brunt	Scattered elements of entire body. Found at height of cervicale vertebra.

carnivorous predators, they are discussed alongside the primary burials. There is a clear preference of two types of fauna, namely, lagamorphs (rabbits and hares) and rodents (*Peromyscus sp.*), that were eaten by large carnivores (felids, canids and eagles) and serpents respectively (Table 5.9). Apart from these remains, a few other small mammals (Mexican vole, Mexican gray squirrel, unidentified small mammals) were discovered in the fill. They do not represent animals that partook in the ritual and therefore are not discussed. In addition, other unidentified bird remains were mixed in the stomach contents. These small bird body parts were probably unrelated to the systematic artificial feeding of the carnivores with rabbits found across dedicatory caches. These are also listed in Table 5.9 as part of the stomach contents.

Across offering contexts eagles were fed most frequently; seven individuals enjoyed their meal prior to the ritual slaughter. In comparison, only one wolf and two felids were fed. Five serpents had stomach contexts associated with their skeletal remains, demonstrating a uniform indication that ritual feeding may have been a common practice prior to sacrifice for all species involved. While more eagles were fed, they were also the most abundant sacrificial victims (n=23), and thus is no surprise to find that they had more frequent evidence of consumption activities.

Several individuals consumed multiple animals prior to their slaughter. For example, a puma from Entierro 6 (Elemento 1818.1) ate two cottontails (Elementos 1818.2 and 1818.3) and an unidentified small bird (Elemento 1818.4). Interestingly, some bones not only had gastric etching from the intestinal acids, but also discoloration due to burning. Similarly, the caged wolf from Entierro 2 (Elemento 213.1) consumed one hare and one cottontail, again with indications of gastric etching, discoloration and burning. While the majority of the stomach contents do not demonstrate burning, the presence of at least seven animals from the stomach content distributed throughout Entierros 2, 6 and Ofrenda 2 alluded to the practice of artificial feeding. The uniform indication that lagamorphs or rodents were selected for the sacrificial victims demonstrates that ritualistic feeding was an integral part of the ritualization process.

Lagamorpha

In total, 15 lagamorph remains were identified from the offerings, out of which the majority consisted of cottontails (*Sylvilagus* sp., n=13) while hares (*Lepus* sp.) were the minority (n=2). This may be due to the relatively smaller size of the cottontails, but could also be because they are easier to manage in captivity to maintain a constant protein source to feed these carnivores. Unlike hares, cottontails den easier and can withstand being with other cottontails while hares tend to require more open habitats.

Among the cottontails identified, they were all found to be one of two species, the desert cottontail (*Sylvilagus audubonii*) and the eastern cottontail (*S. floridannus*). These two species were identified throughout Teotihuacan, and the only other species not identified was the Mexican cottontail (*S. cunicularius*). The emphasis on the desert and eastern cottontails makes sense considering the size range, as they are far smaller than the Mexican cottontail that can reach the size of a small hare. Unfortunately, the three hare bones identified were not identified to a species level.

Lagamorph stomach contents were found in Entierros 2, 6 and Ofrenda 2, but none were identified from Entierros 3 and 5. This is because there were no complete sacrificial victims from Entierro 3 and only serpents from Entierro 5 consumed microfauna, mainly the deer mouse (*Peromyscus* sp.). A hare metapodial was also found in the fill of Entierro 5. Entierro 2 had the most abundant evidence of lagamorphs (n=8) followed by Entierro 6 (n=5) and Ofrenda 2 (n=2). The majority of the age range identified among lagamorph remains was composed of adults (40%) while juvenile (20%), young adult (13%) infants (13%) and infant/juvenile (7%) were less abundant (Table 5.10). The fact that infants were identified in Entierro 6 is interesting, suggesting that the Teotihuacanos had access to such young lagamorphs.

The remains of eight lagamorphs were identified from Entierro 2. The majority of these individuals were found associated with the sacrificial eagles. The caged wolf also had stomach contents. In one case, the diaphysis of the left tibia of a cottontail was found associated with a felid head, Elemento 167. This obviously cannot be the stomach content of this felid, but rather was probably either part of the fill matrix or was the remains eaten by the eagle nearby, Elemento 165. There was also an isolated right tibia of a hare found inside the cage of a wolf (Elemento 213.1). As this wolf contained the remains of both a hare (Elemento 213.2) and rabbit (Elemento 213.3) in its stomach content, it seems appropriate to consider that the isolated bone of the hare was just the scraps of the feast this wolf consumed prior to

Table 5.10 Age distribution (MNI counts) of lagamorphs for each offering.

	Entierro 2	Entierro 6	Ofrenda 2	Total #	Total %
Infant	0	2	0	2	12
Infant/Juvenile	0	0	1	1	6
Juvenile	1	1	1	3	18
Young Adult	2	0	0	2	12
Adult	6	1	0	7	41
UnID	1	1	0	2	12
Total	*10*	*5*	*2*	*17*	

being buried arrive. Unfortunately, no carnivore gnaw marks were recorded on this isolated bone to confirm this interpretation.

Five rabbits were consumed in Entierro 6 including one unidentified cottontail, two desert and two eastern cottontails. These remains represented various fragmented bones throughout the body, suggesting that a complete rabbit was fed to the carnivore. Judging from the lack of forelimb, cranial and axial bones on Elementos 1991.2 and 2069.2, it is likely that in these two cases these carnivores were just fed hind quarters. Only one hare metapodial fragment was excavated from Entierro 5. This bone was probably fill refuge because it was an isolated element with no carnivore remains nearby. Entierro 3 contained no lagamorph remains.

Ofrenda 2 in the Sun Pyramid included a complete eagle that ate two cottontails before it was sacrificed. Both of these individuals were represented by scattered bones throughout the body, indicating the entire corpse was fed. During excavation the exact location of each of the cottontail skeletons was recorded. Elemento 211.2, of a juvenile was found in the lower ribcage or synsacrum of the eagle; already in the abdominal cavity. On the other hand, Elemento 211.3 was excavated near the cranium, around the cervical vertebra; this younger individual was literary being swallowed when the eagle was sacrificed. The specific position of the consumed rabbits allows for a graphic depiction of the timing in which animals were fed and the number of times this occurred. This evidence makes us reconsider if other carnivores that consumed multiple animals were also not fed at different point during the ritual.

Rodentia

The rodent remains found in the stomach of the rattlesnake were very small and often incomplete, making it difficult to assign age and sex of the individuals. Most of the rodents were found in Entierro 5 were deer mouse (*Peromyscus* sp.), probably selected as optimal prey for the rattlesnake due to its small size. Isolated boness were found disarticulated and mixed in with the ribs. Since rattlesnake tend to swallow their prey whole, these mice were probably fed complete. The discovery of these rodents help prove that the rattlesnakes were deposited as primary burials even though the entire skeleton did not always preserved. Rattlesnake were also fed prior to their sacrifice, suggesting a sort of uniformity in the overall ritual procedure although different prey were suitable for different species. None of these rodents had any surface modifications demonstrating burning or other forms of preparation. On one occasion a rattlesnake (Elemento 1494.1) consumed two rodents.

Evidence of rodent-fed rattlesnake in Entierro 5 opens up questions whether this was practiced in the other contexts. Entierro 2 contained the remains of at least six rattlesnakes, but no rodent remains were identified; no ritual feeding occurred in this case. Entierro 6 also contained a large concentration of rattlesnakes found inside an organic woven basket. However, because the analysis of these skeletons was done utilizing digital MRI images, it was impossible to determine if the rattlesnake contained stomach contents.

The remains of one Mexican gray squirrel (*Sciurus aureogaster*) including seven cranial fragments, third right metacarpal, seven phalanges, two claws, and incisors were found in Entierro 6. These bones (Elemento 2207) had evidence of burning. It is difficult to interpret if these remains were part of the fill matrix or were consumed by the other animals in the burial chamber. As these bones were isolated and because rodents and lagamorphs were the preferred prey among the sacrificial victims, it is assumed that the remains of the squirrel were merely part of the fill refuse.

Primary Burials

Summarizing the zooarchaeological evidence of primary deposits, the species diversity and their distribution indicate that the Teotihuacanos were carefully selecting highly specialized animals for the ritual spectacle. Felids, wolves, eagles and rattlesnake became key sacrificial victims, particularly during the fourth construction phase observed in Entierros 2 and 6, as they were the only primary burials that were repeatedly utilized in multiple offering contexts as sacrificial victims. The majority of the other animals that amplified the species diversity were mostly composed of secondary deposits, particularly of diverse avian species. The one exception is the crow that was found in Entierro 5 associated with an eagle; in this case this individual was probably deposited complete.

The zooarchaeological investigation of these primary burials demonstrated a complicated narrative where animals were captured in anticipation to the ritual to be tamed and kept within the city confines. Many pathological indicators suggested there was a deep understanding of and interaction with these ferocious carnivores before and during the ritual spectacle. Particularly among eagle remains, complex life histories of these raptors was presented, demonstrating that even secondary burials were composed of individuals that were most likely caught in preparation to the ritual event, kept in confinement, and processed extensively, possibly even by a taxidermist, to participate in the ritual performance looking intact. It was argued that many of these primary burials, especially from Entierros 2 and 6, were buried alive. In continuation the faunal remains of secondary deposits, ritual paraphernalia, are discussed to recreate the production process.

Chapter 6

Secondary Burials: Reproducing Ritualized Production

Animal products are often elaborately depicted in the iconographic record throughout Mesoamerica. Animal bodies were a fundamental component of ritual performances as they were utilized as costumes, musical instruments, adornment, prayer sticks, and other ritual regalia. The use of such animal body parts ensouled the wearer with the animal's spirit, physically manifested and reenacted in ritual performances. Analyses of such ritual paraphernalia incorporated into dedicatory caches are presented separately in this chapter because a distinct interpretive paradigm than that utilized for primary burials is applied. This chapter attempts to reconstruct the ritualized production of animal paraphernalia and what the end product would have looked like when it entered the ritual scene. In reconstructing the processes governing the manufacture of highly specialized faunal products, some of the questions asked are: which animals were chosen to be sacrificial animals versus secondary products, when did producers come in contact with the raw material (fresh kill or post-decomposition), how standardized was the production process, were there chronological trends in production techniques, is there evidence for captive management of animals used for producing ritual paraphernalia, and what body parts were important for each of the species involved.

The methodology applied is the same, rigorous zooarchaeological analyses, but there is a more acute focus on recording the element distribution and surface modifications. The overlap analysis vividly illustrates which body parts were repeatedly utilized as part of the final product versus what areas were discarded during processing. The location of surface modifications such as cut marks, fractures and perforations help detect patterning, redundancy and purposiveness (Lyman 1987:260). Were these modifications inflicted during pelt extraction, dismemberment or extraction of other secondary products? Do perforations indicate attempts to keep skeletal integrity or the construction of adornments? In some cases particular skeletal elements were deposited bare while other materials would have been prepared pelts or feathered capes. In this manner, I propose a visual schema of what the final product entering the ritual scene would have looked like.

Felids

Two aspects were analyzed through overlap analysis on prepared felid artifacts: element distribution and the spatial patterning of cultural modifications. From these two analyses, overall patterns in the ritualized production process of specialized felid ritual paraphernalia were observed. Particular aspects about how these crania were prepared and what the final product deposited in the offering looked like is discussed for each of the contexts.

Element distribution

There was an obvious focus on skulls throughout all dedicatory caches for felids and canids (described below). Sometimes their claws and phalanges would be deposited together with the skull or grouped as an independent unit. Unlike the avian materials, no other isolated elements were deposited. These claws may have been attached to perishable pelts, as they tend to be extremely difficult to separate from its skin.

The overlap analysis of cranial elements from each of the contexts was central to designating final MNI counts that are reflected in Table 5.1. This was particularly the case for secondary burials where the delineation of an individual was extremely difficult during excavations and many elements were probably mixed with other nearby contexts. The overlap analysis of the cranium and the mandible were the primary elements utilized, paying particular attention to its dentition; as it is the hardest, best preserved and most readily identifiable element. For example, the scarce presence of the cranial fragments in Entiero 5 contrasts sharply with the extremely dense overlap of the teeth (Figure 6.1). It is from such analyses that an MNI of 15 was calculated despite the presence of 11 Elemento numbers assigned during excavations (no complete nor isolated claw/phalange elements included). This number is more realistic than the total of 19 subdivided Elemento numbers (e.g. Elemento 1381 was divided to Elemento 1381.1 and 1381.2) (Table 5.3).

Some areas of the cranium were consistently retained while others were discarded during skull processing. Unfortunately, the materials from Entierro 5 were not comparable because these findings were skewed by the taphonomical processes that only preserved its dentition.

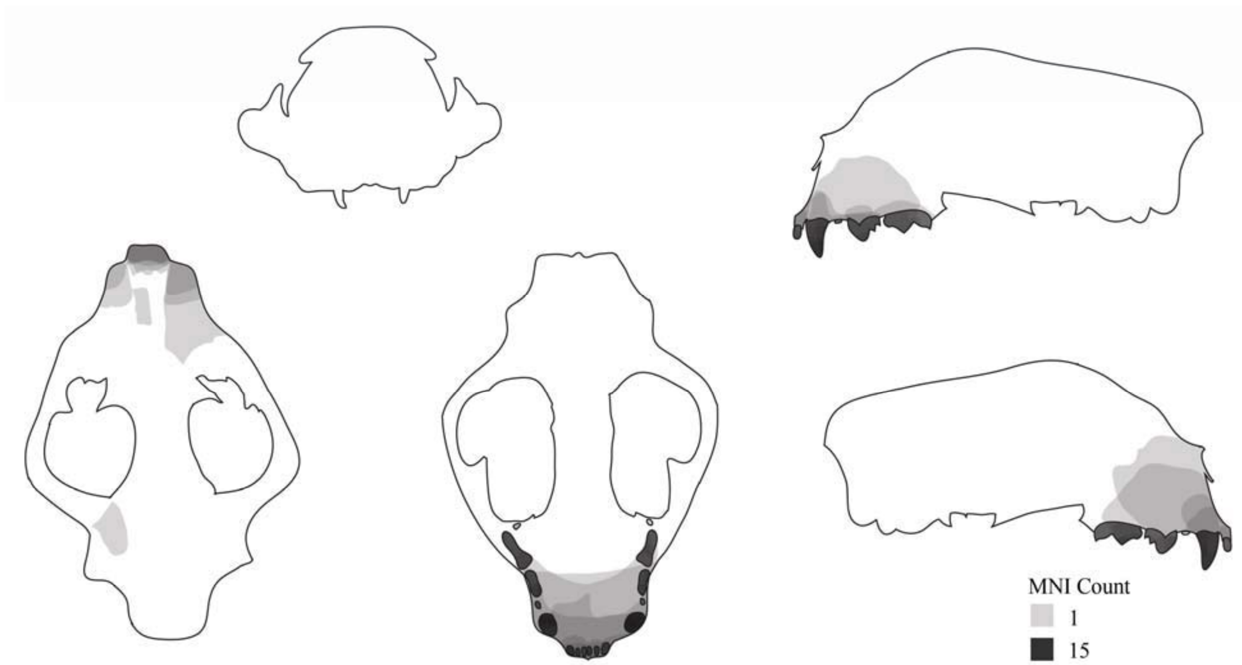


Figure 6.1 Overlap analysis of the cranial fragments of secondary deposits of felids from Entierro 5. When available, only the maxillary elements were identified and a parietal fragment was the only other bone represented. A similar argument can be made for the obvious difference in the overlap of maxillary dental fragments found in Entierro 3 versus the relatively low density of the bony areas. Nonetheless, at least half the MNI materials contained associated cranial bones that were mapped out, providing a useful comparison.

Generally, there are two patterns in the processing techniques of felid crania: those that attempted to retain the majority of the cranium intact, extracting the encephalic mass from a small opening in the occipital region and those that discarded the majority of the brain case leaving only the frontal portion of the cranium intact. Entierros 2 and 6, and Ofrenda 2, usually favored the former processing technique while Entierro 3 contains no evidence of the neurocranium (Figure 6.2). The similarity observed between Entierros 2 and 6 were not surprising considering the close temporal overlap as well as the parallels observed in the overall composition of the faunal materials. Only one felid skull was deposited in Ofrenda 2 at the Sun Pyramid, it more closely matches the preparation techniques associated with Entierros 2 and 6, which kept the majority of the neurocranium intact.

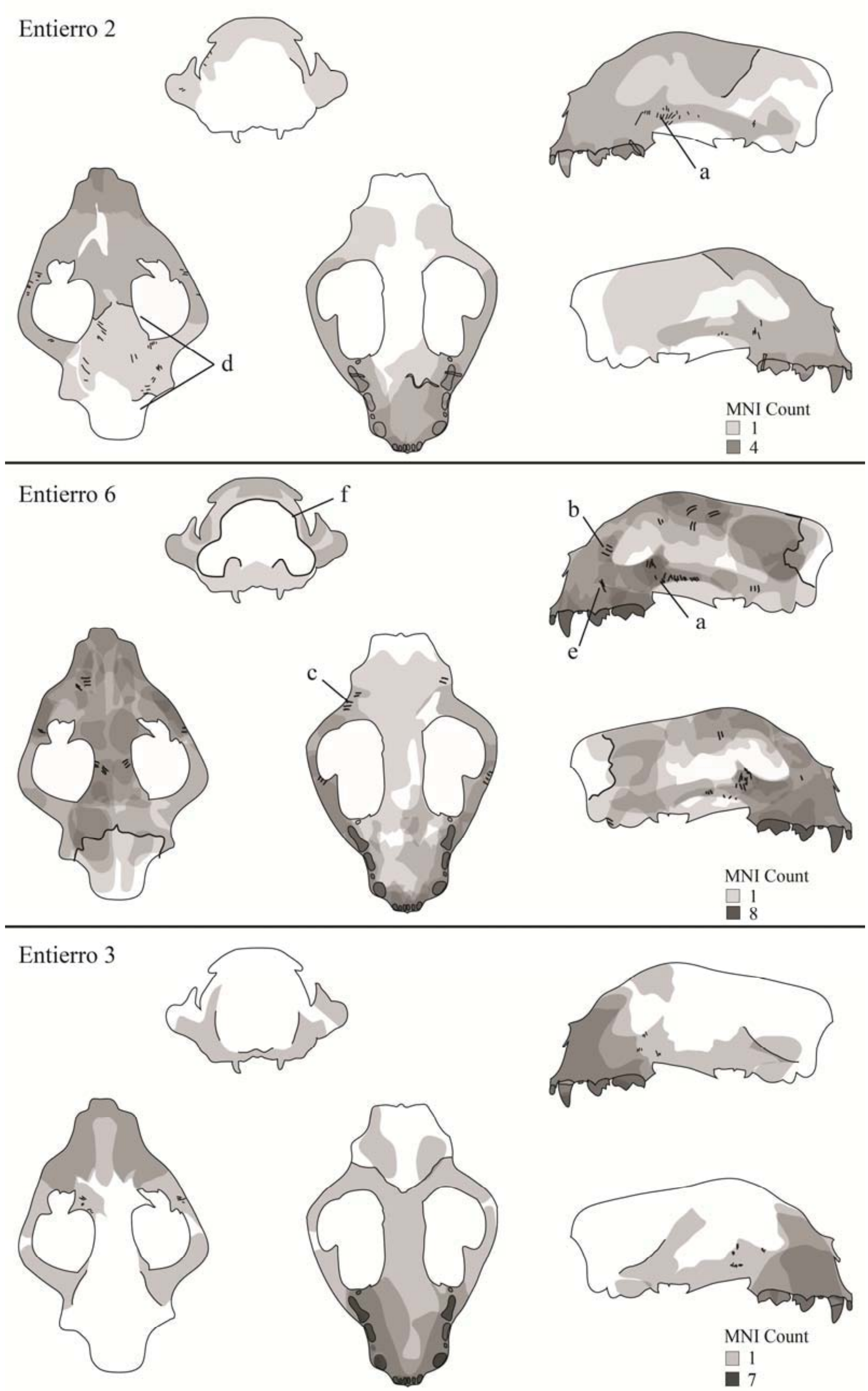


Figure 6.2 Overlap analysis of secondary felid remains from Entierros 2, 6 and 3; a) zygomatic bone; b) lacrimal bone; c) condyloid fossa; d) neurocranium; e) maxilla; and f) nuchal crest.

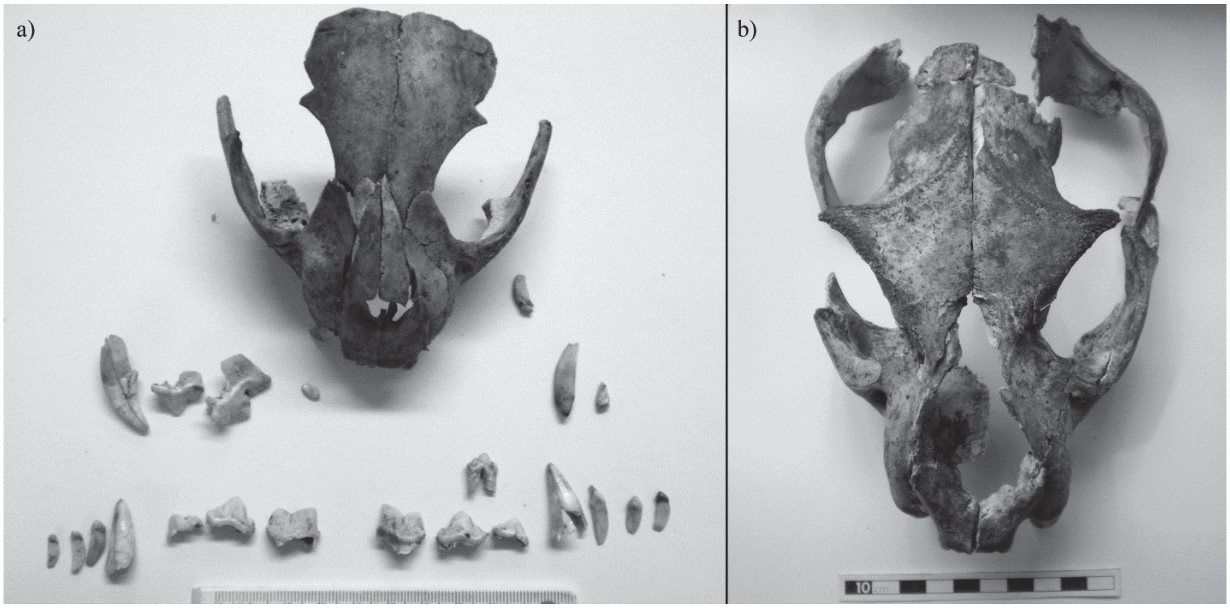


Figure 6.3 Examples of two cranial preparation types from Entierro 6; a) prepared jaguar (Elemento 2195) and b) prepared puma (Elemento 1941).

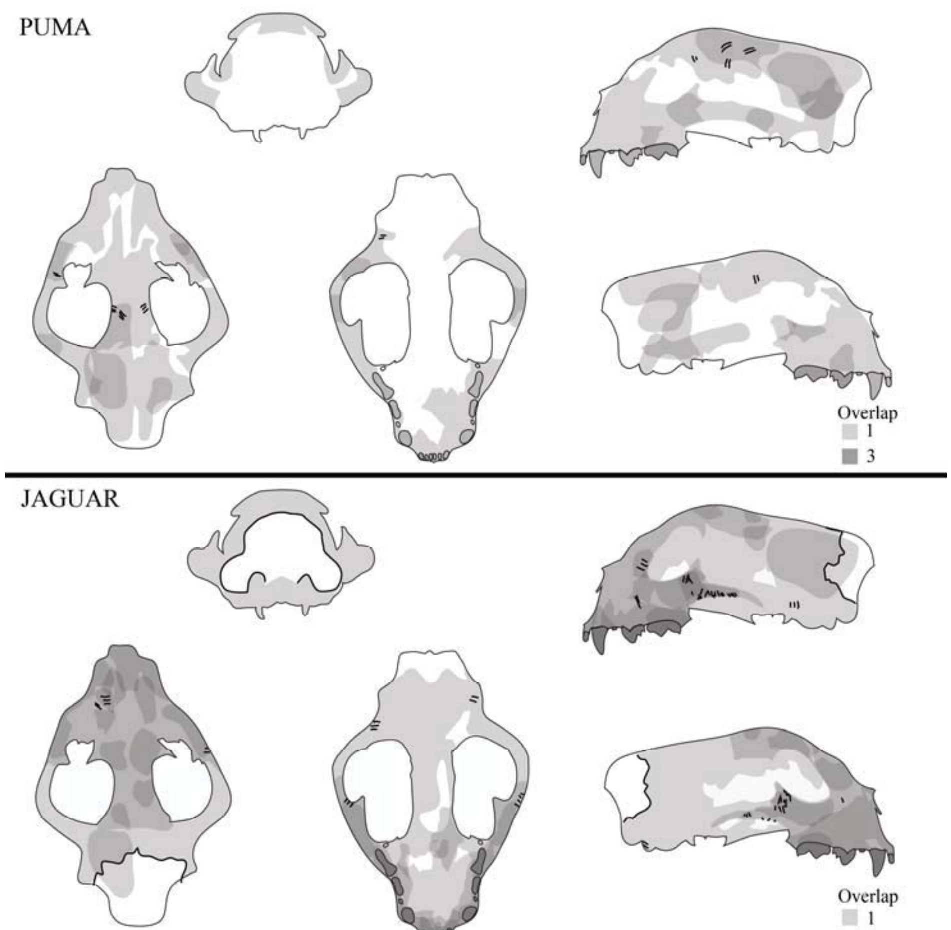


Figure 6.4 Puma and jaguar cranial overlap from Entierro 6.

Despite these general trends, there was still a large degree of variation within an offering. This was particularly the case with Entierro 6; although the majority of well-preserved skulls contained the neurocranium, others were highly processed. An excellent example of this intra-offering variation is the cranium of a jaguar infant, Elemento 2195, that was highly processed and that of a young adult puma skull, Elemento 1941, which retained the braincase (Figure 6.3). This variation was not caused by differences between the manufacture of puma versus jaguar paraphernalia, as both species were prepared variably between highly processed and more complete crania (Figure 6.4). What this suggests is that there was no well-established standardization in the manufacturing techniques of felid crania from Entierro 6, possibly because the sources from which these cranial bones were brought in also varied.

On many occasions, the mandible was better preserved than the cranium, allowing for more accurate MNI counts based on the overlap analysis. For example, the MNI count based on the cranial fragments from Entierro 6 was eight while the total of the mandible pieces were nine. This is probably because the mandible is composed of a thicker cortical bone than the softer and irregular cranial fragments. Like the cranium, there were generally two methods of mandible processing (Figure 6.5). On the one hand, some retained the ramus and coronoid process, keeping the mastoid-coronoid articulation intact. On the other hand, others were more extensively processed, discarding the ramus either after the M1 or in between the Pm4 and M1 juncture. In such cases, the mandible and cranium would not have been articulated at the time of deposition but simply laid on top of or beside each other.

Entierro 5 was the only context that consistently favored the full processing of the mandible; none of the mandibles retained the ramus, coronoid process, articular process, or angular process. Entierros 2 and 3 seem to have applied both techniques, demonstrating intra-offering variation. Entierro 6 and Ofrenda 2 of the Sun Pyramid, on the other hand, preserved the entire mandible, although the preservation obviously caused some degree of variation.

Surface modification

Surface modifications including cut marks, fractures, burn marks and pathologies were identified on the phalanges, crania and mandibles. Phalanges with cut marks, particularly along its shaft, implies

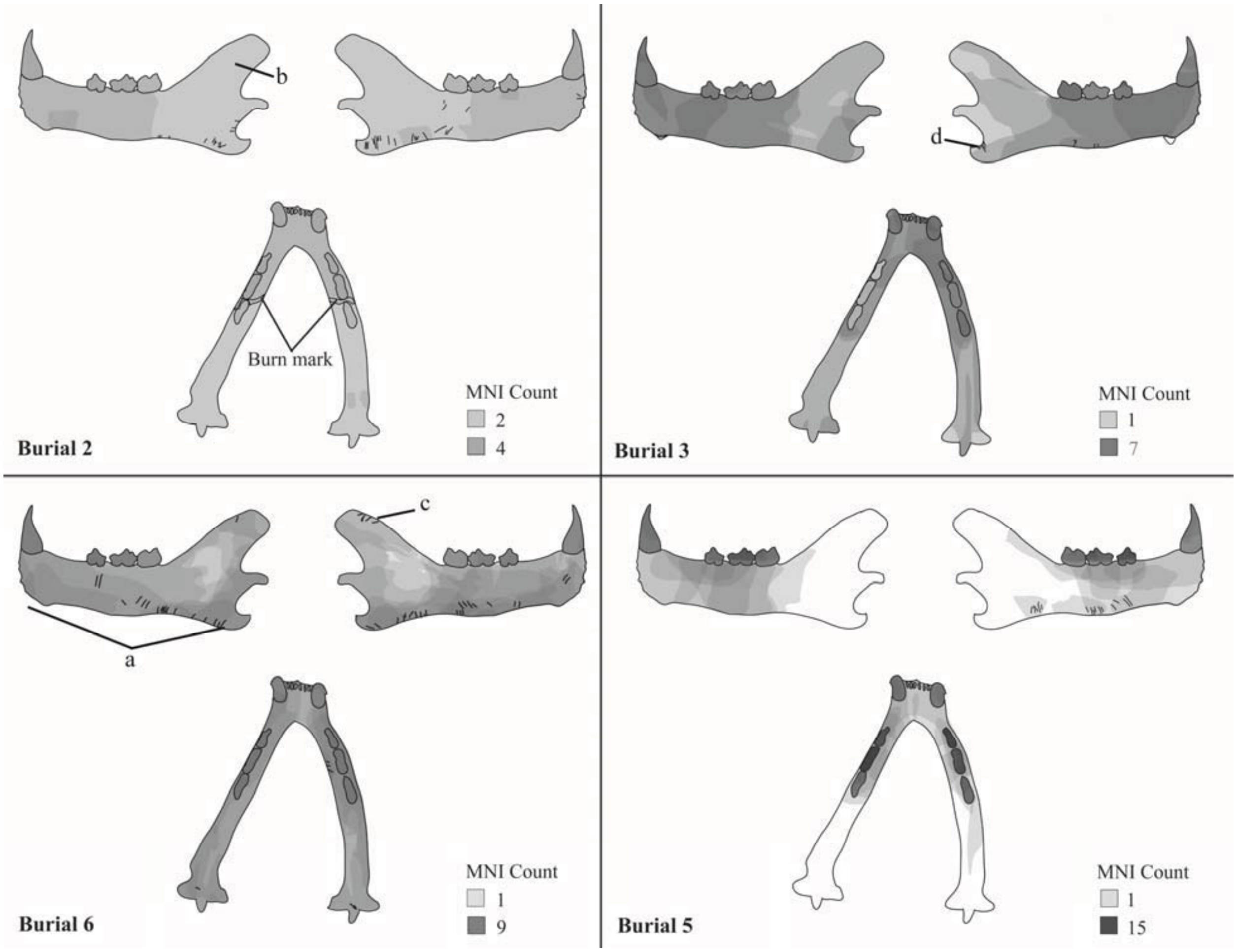


Figure 6.5 Overlap analyses of felid mandibles from Entierros 2, 3, 6 and 5; a. body of mandible; b. ramus; c. coranoid process; and d. angle.

that the pelt of this animal was carefully extracted, cutting along the bones right underneath the skin. Many of the phalanges found isolated had no cut marks while some of the claws/phalanges associated with its head exhibited cut marks; suggesting that in the former case the pelt was still attached while in the latter the digits were isolated from its pelt. A good example of this scenario are the remains of distal phalanges of both the fore and hind limb associated with a puma skull from Ofrenda 2 in the Sun Pyramid which contained multiple cut marks ingrained along the lateral and medial shaft (Figure 6.6). It would have been difficult to extract the pelt completely from their digits and maybe a complete paw would be deposited with the head. In some cases, the articular sesamoids were still present (E.g. Elemento 643, Entierro 3) suggesting that their paws were still articulated.

Figure 6.6 Phalanges of puma (Elemento 151) with cut marks along the shaft.

Figure 6.7 Felid digit (Elemento 657) from Entierro 3 with pathology on the proximal (left) phalange.

In one instance, Elemento 657 (Entierro 3), a set of phalanges, two sesamoids, and a claw of a single digit were found with a pathology on its proximal phalange (Figure 6.7). There was apparent remodeling around the shaft of this phalange, possibly caused by an injury. Unfortunately the location where these bones were excavated could not be confirmed to investigate if this digit was associated with any other bones. This pathology parallels evidence for wounded and sick animals kept in captivity for sacrifice discussed in the previous chapter. While no conclusions about its captive state can be made based on this singular find, it still brings up the possibility that some of the felids utilized for ritual paraphernalia were also kept in confinement. Certainly there was ample evidence of this practice among prepared eagles and should also be considered for the felid remains.

The remains of a mature puma from Entierro 3, Elemento 571.1, also supports this hypothesis. It exhibited a pathology on the inferior mandibular symphysis that was completely fused, and a bump on the chin was identified. It is likely that the bone was inflated either as a result of being hit on its chin or some complication during the fusion of the symphysis, causing abnormal bone remodeling in this area. This individual represents one of the largest felid skulls found in this collection, and was initially misidentified as a jaguar due to its size. Pronounced muscle markings also demonstrate this was a very large male. Its cranium and mandible was one of the only three elements with cut marks in this context.

The quantity of cut marks on crania varied significantly, ranging from some with absolutely no cut marks, to others with multiple marks etched onto a single bone. However, it was impossible to quantify these results because of the strong bias in bone preservation, in some cases completely eliminating any possibility to reconstruct the bones due to its powdered state. This was the case for Entierro 5 where teeth were the only elements reliably reconstructed and only one mandible (Elemento 1517) displayed cut marks. This probably does not mean that there were no surface modifications, but rather demonstrates the extremely degraded state of the collection that obscured such finds.

Examining the crania from Entierros 2, 6 and 3, the percent of skulls with cut marks and the density of cut marks on crania from Entierros 2 and 6 was higher, while relatively little cut marks were recorded on crania from Eniterro 3 (Figure 6.2). Ofrenda 2 of the Sun Pyramid exhibited many more cut marks on this single cranium than those recorded in Entierro 3, demonstrating the extreme absence of cut marks in this collection.

Many of the cut marks found on the head were distributed along areas where the pelt would have been very close to the bone, requiring careful scrapes to be made perpendicular to the bone to extract the pelt. This explains the concentration of overlapping cut marks along the zygomatic bone marking the repeated scrapping movements as the carver struggled to detach the pelt (Figure 6.2a). In some cases these cuts were even found along the superior surface of the zygomatic bone and even on the lacrimal bone, inflicted during the extraction of the eye socket (Figure 6.2b). Muscle insertions and attachment sites for tendons are points where added pressure would have resulted in cut marks during pelt extraction. For example, deep groves were identified close to the condyloid fossa where the mandible attaches to the cranium (Figure 6.2c). The mandible was most likely disarticulated from the cranium, scraping along this joint, as the pelt was also extracted from the mandible.

When the neurocranium was present, cut marks were found along the parietal, frontal and temporal bones (Figure 6.2d). These marks were particularly prevalent along the frontal-parietal joint, as well as the temporal line where the mastoid muscles attached to the cranium. This suggests that not only the pelt, but also the temporal muscles that attached along the temporal line were extracted. A few cut marks were recorded on the ventral surface of the maxilla indicating the thorough skinning process, even along its snout (Figure 6.2e).

The dorsal opening from which the soft tissue in the brain case was removed varied in form. Often, producers took advantage of natural sutures, cutting along the edges of the frontal-parietal suture, the temporal-parietal suture, or the sphenoid-temporal junctures. In some cases there were irregular breaks as a result of extracting solely the occipital region, particularly by detaching the nuchal crest (Figure 6.2f). This was accomplished by either cutting into the bone, usually marking smooth cuts, or by breaking this area away. In the latter case, fracture patterns indicated that this was conducted when the bone was still green after other secondary products were removed.

Figure 6.8 Felid maxilla (Elemento 187) from Entierro 2 with dark burned areas indicated by the white arrows.

In one instance (Elemento 187, Entierro 2) the edges of the maxilla and areas of the mandible of a puma cranium were discolored between dark brown and black with a flaky appearance, suggesting that heat was applied to this area (Figure 6.8). It is possible that the heat aided the processing procedure, as the burn marks were found along the edges of the maxilla and mandible along the fractures.

The cut mark distribution on the mandible varied for the two processing techniques was applied. Hardly any cut marks were reported when only the frontal portion of the mandible was conserved, versus extensive cut marks were engraved along the body of the mandible, particularly on the lateral and inferior sections, and in the angular process when the entire mandible was preserved (Figure 6.5).

In the case of Entierro 6, the difficulty in separating the cranial-mandibular articulation was indicated by the deep groves ingrained along the superior surface of the coronoid process (Figure 6.5c). Like the cranium, the distribution of these marks coincides with areas where the skin would be very close to the bone (lateral surface of the body of the mandible), articular surfaces, and muscle attachment areas (particularly along the angular process where many muscles and tendons attach). The distribution of cut marks on both the cranium and mandible agrees with the interpretation that the pelts, and in some cases the meat and other soft tissue, were procured.

Reconstructing felid artifacts

The element and cut mark distribution indicate two preparation techniques; the skulls of the animals were either left with minimal modification to preserve the complete form of the skull including areas of articulation between the cranium and mandible, or extensive modification of the skull resulted in the retention of the snout and the frontal section of the mandible. Within each context there was some degree of variation, but overall Entierros 2, 6 and Ofrenda 2 favored the former pattern that attempted to retain the form of the complete skull while Entierros 3 and 5 were composed of highly processed artifacts.

In Entierros 2, 6 and Ofrenda 2 the skulls would have been bare, with no pelts attached, with the exception of the isolated paws that may have been kept articulated to its pelt. The skulls were most likely prepared while the bones were in a green state, requiring extraction of secondary products like the skin, meat, and other soft tissue. This interpretation is based on the extensive distribution of the cut marks demonstrating that the skin was extracted while the meat and muscles were still intact. Fracture patterns also agree with this interpretation; non-fresh breaks looked like they were inflicted while the bone was still green.

Entierros 3 and 5, on the other hand, exhibit fewer markers for reconstructing its production process, making it difficult to determine when the processing would have taken place. The lack of cut marks was exacerbated by the poor preservation conditions which already made reconstructions difficult. Nonetheless, we cannot ignore the obvious difference in the distribution of cut marks and the sparse osseous remains of the neurocranium. Most likely many of the skulls were processed at different stages, adding to the confusion.

In total, only three Elementos from Entierro 3 contained cut marks. A pair of canines, Elemento 512, was cut transversally where the enamel ends, and probably represents an isolated pair of canines prepared independent of the skull. The mandible of Elemento 560.1 only contained three marks along the inferior body of the shaft. Thus, only one skull, Elemento 571.1, had any extensive evidence of cut marks on both the cranium and the mandible recording that pelt extraction took place. There was no evidence that all of the skulls were prepared while the bone was green, nor that they were extracting other secondary sources from the skulls.

Entierro 5 contained even less direct evidence of surface modifications; only one individual, Elemento 1517, exhibited cut marks on the mandible. Unfortunately no crania contained cut marks from this chamber. To reconstruct the faunal products from Entierro 5, the context must be closely examined. Unfortunately, the taphonomical processes of Entierro 5 on the felid skulls prevented cranial fragments to be drawn onto templates for the overlap analysis. This explains why most of the animals were represented solely by their dentition. However, there were not enough cranial pieces, even if they were fragmented to account for the number of animals identified. On many occasions, multiple individuals were recorded, sometimes totaling up to five individuals represented in one bone concentration. Greatest overlap was found on the left maxillary canine (n=15) and the right mandibular third premolar (n=15). Incisors and back cheek teeth were not as abundant. These observations suggest that some of the maxillary and mandibular bones may have been prepared as composite figures where teeth from multiple individuals were deposited as a single ritual artifact. This hypothesis is examined in continuation by comparing this assemblage to animal adornments uncovered at the Feathered Serpent Pyramid (FSP).

Canids

Not all the offerings included prepared canid skeletons and Entierro 5 only contained scant remains of a highly fragmented canid head that did not present surface modifications. Thus, this section only discusses materials from Entierros 6 and 3, as well as a canid skull from Ofrenda 2. Following the analytical strategies employed for felid skulls, patterns in element distribution and surface modification is examined to reconstruct the form and the production sequence of canid paraphernalia.

Element distribution

The overlap analysis of the canid remains was essential to calculate the MNI of Entierro 3. Like the felid skulls from Entierro 5, many of the canids included extremely deteriorated remains that were

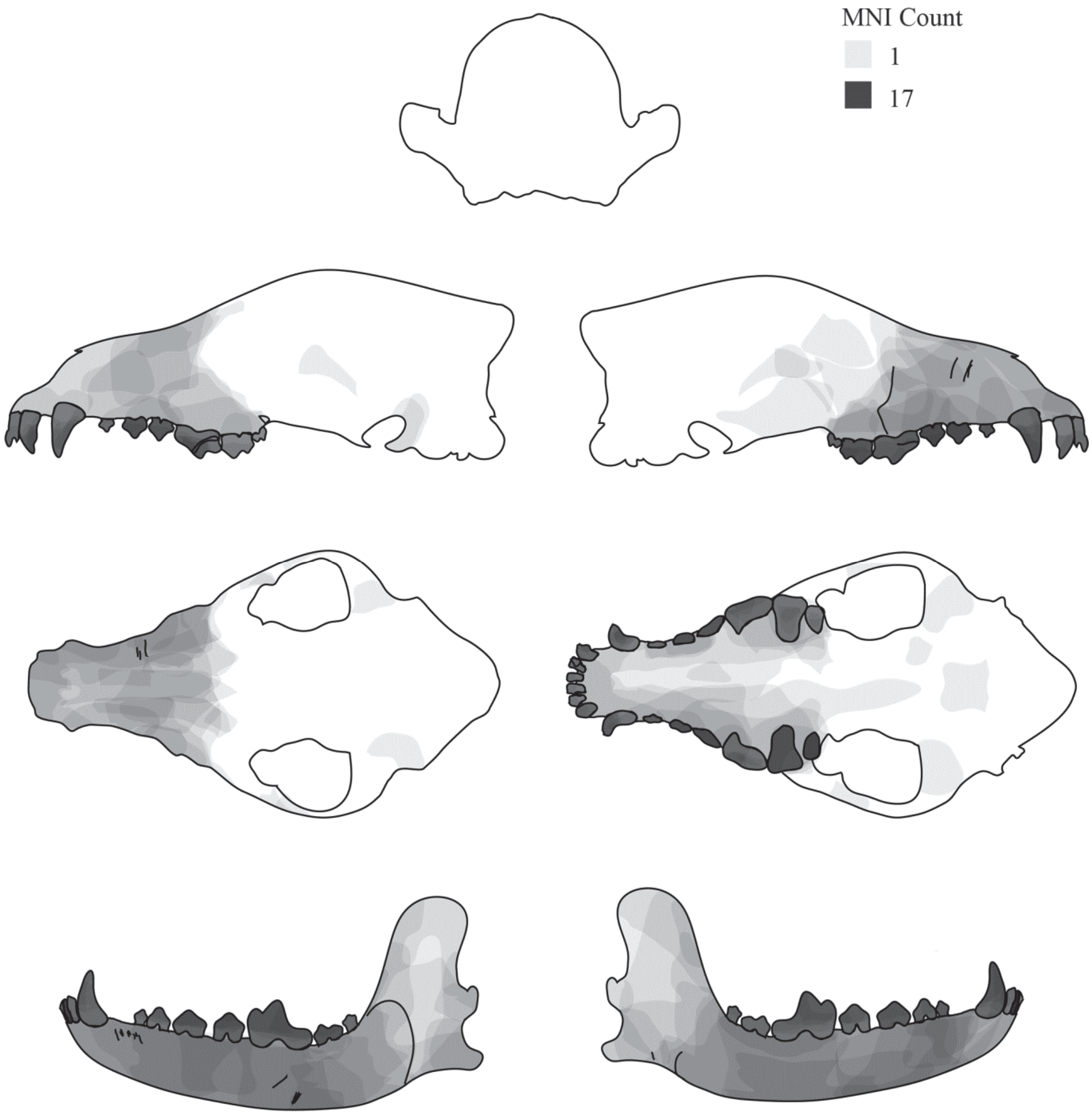


Figure 6.9 Overlap analyses of canid skulls from Entierro 3.

vaguely defined in the field, in many cases lumping the remains of multiple individuals into one Elemento number. Each bone/tooth fragment was drawn onto templates that calculated a total of seventeen wolves based on the overlap of the mandibular third premolar and second molar (Figure 6.9). This total exceeds any of the other offerings, and is even more numerous than the felid remains. Obviously, there was an emphasis on wolves in this context. Entierro 6 included the remains of eight skulls and one complete primary burial; in total nine canids were used.

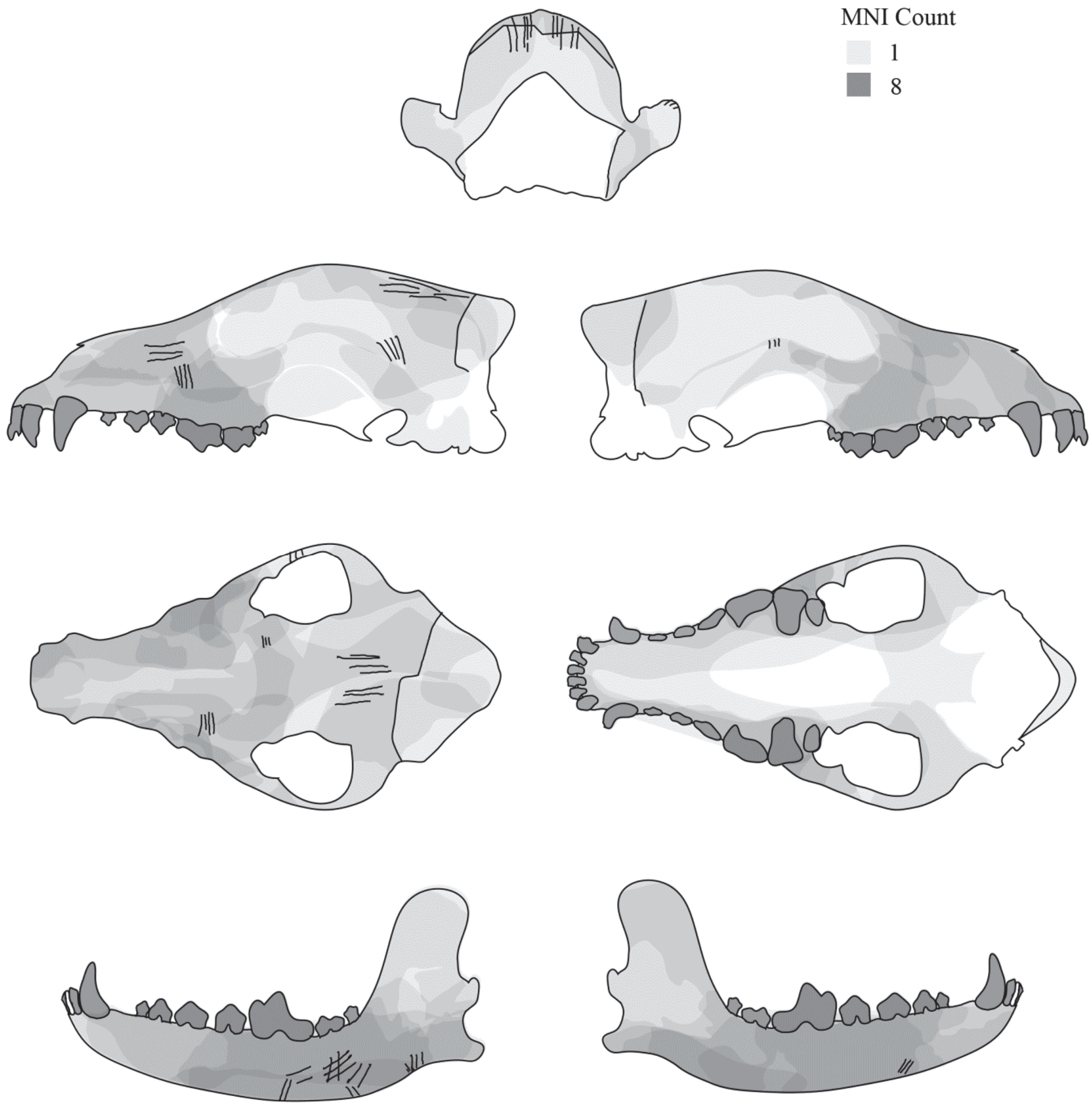


Figure 6.10 Overlap analyses of canid skulls from Entierro 6.

Examining the spatial overlap of the canid cranium, there was a striking difference between Entierro 3 (Figure 6.9) and 6 (Figure 6.10). Entierro 3's distribution obviously lacked fragments of the braincase, instead their distribution concentrated on dental and maxillary fragments. There was a focus on the snout of the canid; the crafters did not care to leave the overall form of the entire cranium in place.

On the other hand, canid crania deposited in Entierro 6 varied. Three specimens were reduced to only the snout, four contained at least some fragments of the braincase, and only its dentition was identified for one of the individuals. While the teeth and maxilla were most abundant, several crania clearly retained its neurocranium. The only areas that were not represented included the occipital region below the nuchal crest, and some areas of the tympanic bulla, palatine and vomer bone. Similar to the felid crania, the occipital region was most likely discarded during the extraction of the encephalic mass, while the absence of the tympanic bulla, palatine and vomer bone can more readily be explained by the thin bones being more susceptible to the harsh taphonomical conditions of the burial environment.

The cranium from Ofrenda 2 (Elemento 209) retained the neurocranium, conserving the overall form of the head (Figure 6.11). The complete lack of the occipital region is not surprising given the repeated absence of this area in all the specimens from Entierro 6. The absence of the remaining areas can be explained by differential preservation.

The preparation techniques of the mandible exhibited much more variation with no consistent patterns between offerings. Like the felids, there were two preparation techniques applied on the mandible. Some mandibles were cut and processed, lacking the ramus, articular process and the angular process, in which case only the body of the mandible with its tooth row were preserved. Others lacked these elements to varying degrees, which could also be the result of high fragmentation in this area, while still others conserved the entire mandible. In the case of Entierro 3, there was a comparable number of complete mandibles (n=5), some that were modified more extensively (n=7) and yet others that only preserved their teeth (n=5). Despite the overall lack of the mandibular fossa where the mandible would have attached (except Elemento 573.1), the producers still decided to retain the form of the complete mandible on at least five of the mandibles. These mandibles, although complete, would not have had a point of articulation with its corresponding cranium.

Entierro 6 similarly contained mandibles that retained its complete form (n=3), some that were incomplete (n=4) and in one case only its dentition was preserved. In two cases, Elementos 2194 and 2079, the mandible was complete and the mandibular fossa was also present, suggesting that the mandible

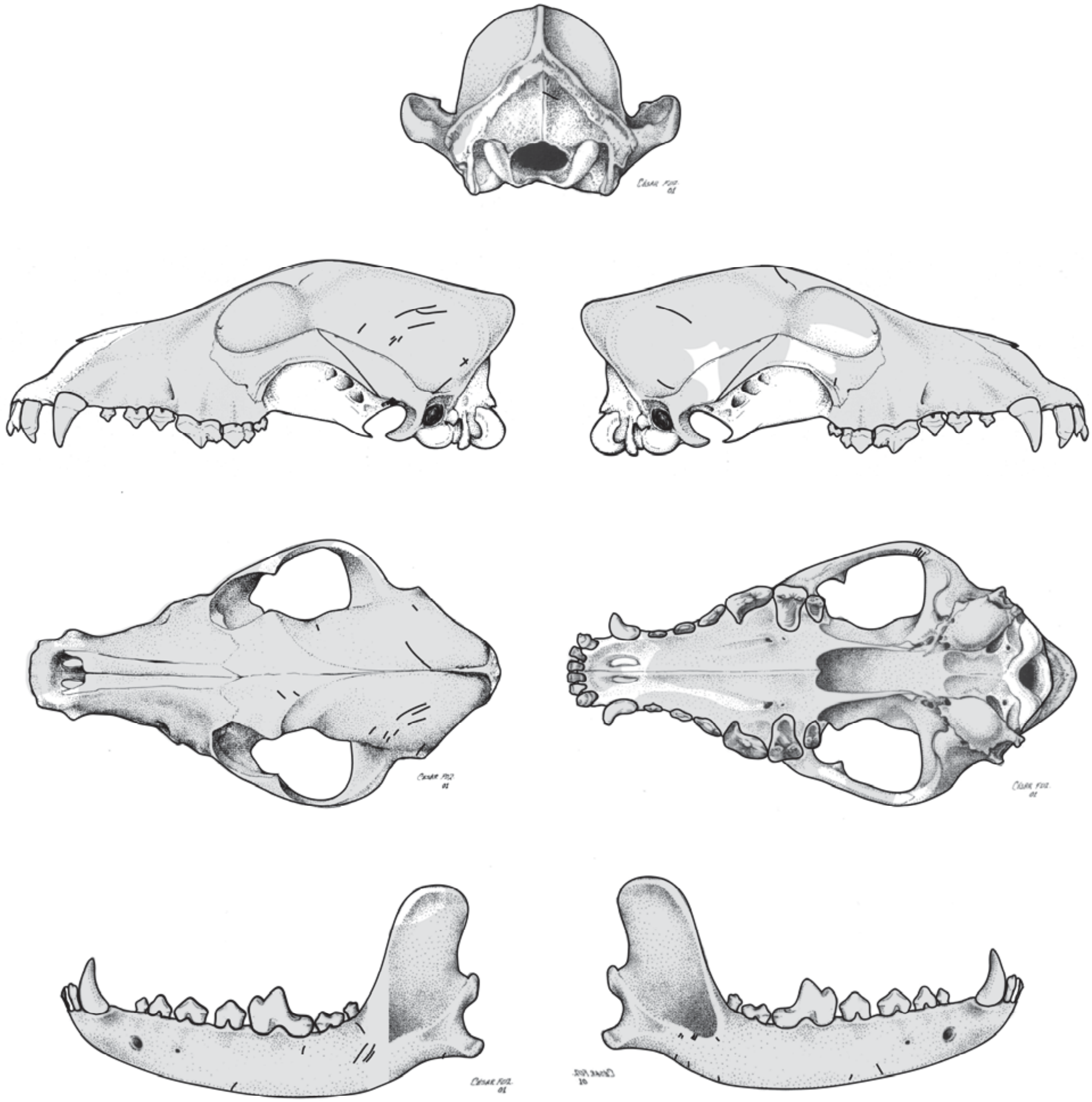


Figure 6.11 Drawing of wolf skull from Ofrenda 2 (Elemento 209). Grey areas are present while black lines indicate cut marks.

and its cranium were articulated during deposition. Elemento 2243 retained most of the mandible intact, but had very scant remains of the corresponding cranium, with only the maxillary, lacrimal and frontal sections preserved; despite the complete mandible, this specimen would have been deposited disarticulated from the corresponding cranium.

The canid mandible from Ofrenda 2 retained most of the mandible intact. In this case, I was able to confirm that the mandible was still articulated with the mandibular fossa during excavation despite the presence of cut marks throughout the head.

Surface Modification

Three types of surface modifications have been recorded among canid crania: cut marks, fractures and intentional abrasion/wearing. By far the most abundant indication of the processing techniques were cut marks distributed throughout the skull. The frequency of elements with surface modification varied significantly by offering. Only two skulls out of the seventeen from Entierro 3 exhibited surface marks. In contrast, five out of eight heads from Entierro 6 exhibited cut marks, suggesting that 75% of the time the processing techniques left surface traces.

The skull from Ofrenda 2 of the Sun Pyramid similarly had extensive surface features. Examining their distribution, it becomes clear that like the felid specimens, the canid head was highly processed, extracting the pelt and other secondary products prior to their deposition. In Entierro 3, Elemento 579.1 was the best-preserved skull with clear cut marks and fractures denoting processing procedures (Figure 6.12). Its maxilla was fractured transversely along the fourth premolar on both sides. On the right side another fracture on the lateral surface separated the snout from the rest of the cranium while on the left side the crafter detached the zygomatic bone along the natural suture between the maxilla, leaving no clear fracture line. Three cuts along the lateral surface of the left mandible demonstrated its skin was extracted from the mandible. The ramus, coracoids process and angular process were detached from the remaining body of the mandible and its complete dentition. The left ramus was removed from the body of the mandible by fracturing along this division and smoothing out the circular edge. Its right mandible probably looked similar although some taphonomical damage obscured its original form.

A unique modification was recorded on the left maxillary second incisor of the same individual. Either extensive pre-mortem wearing and abrasion or a post-mortem fracture that was polished caused this tooth to have a chipped and polished surface. In contrast all the other incisors, although showing extensive wearing, did not resemble this pattern. At first glance, it may be argued that this abnormal

Figure 6.12 Skull of wolf (Elemento 579.1) with surface features outlined in black.

feature was caused by unnatural tooth wear during confinement. Certainly the precedent of a felid skull with completely warn incisors from Entierro 6 (Elemento 1818) make this interpretation a likely possibility. However, because only one tooth exhibits this pattern, this fracture probably occurred post-mortem during skull processing.

Another cranium from Entierro 3, Elemento 642, exhibited cut marks on the right maxilla along the lateral component just above the inter-orbital foramen and the body of the mandible. Interestingly, the cut marks on the left mandible were found very close to the tooth row, just below the gap between the canine and the first premolar. Cut marks on canid mandibles were usually limited to the inferior half of the body where the skin attaches to the bone, making this mark unique. Perhaps the gums along the mandible were difficult to separate from the bony structure.

Surface modifications on the canid skulls of Entierro 6 were both more frequent in the number of individuals exhibiting cut marks and, for the most part, the density in which these marks were left behind. One of the best examples of this pattern is Elemento 2194, a semi-complete skull of a female wolf

Figure 6.13 Wolf, Elemento 2079, from Entierro 6 with a transversal cut in the neurocranium.

between one to two years of age (see Figure 6.18 in discussion below). This individual was prepared to keep the cranium intact, taking advantage of natural contours of the skull to dislodge the occipital region along the nuchal crest. It is from this opening that the soft tissue in the brain case was removed. The pelt was extracted, leaving long sweeping cut marks along the parietals near the sagittal crest, along the left zygomatic, and on both mandibles along the body. A group of phalanges and claws were deposited alongside the skull. The number of claws associated with this head (n=24) suggests the claws of at least two individuals, perhaps mixed from a nearby bones, were present. At least three of the phalanges from this group contained deep engravings along the medial and/or lateral shaft; even along the digits the artisans struggled to detach the pelt.

Other regions with cut marks on the canid skulls from Entierro 6 included: the maxilla just superior to the infraorbital foramen, along the temporal bone, the frontal bone, and the inferior half of the body of the mandible (Figure 6.10). On Elemento 2079 a long transversal cut was placed on the parietal and temporal bones to open up half of the brain case for easy access to the encephalic mass (Figure 6.13).

Preparing a juvenile canid skull from Ofrenda 2, the artisan took advantage of the unfused skeleton, separating the occipital bone along the nuchal crest to create a dorsal opening (Figure 6.11). Like Entierro 6, long large striations on the temporal, parietal, frontal and zygomatic bones demarked cut marks. Cut marks were etched just laterally to the mandibular fossa on the inferior portion of the left zygomatic bone, suggesting that the large muscles associated with this joint were detached during processing. Surrounding the masseteric fossa of the mandible, several cut marks were also observed, implying this robust musculature was removed.

Reconstructing Canid artifacts

Like the felid remains two general types of preparation techniques were applied to the canid skeletal remains: one that retained the complete form of the skull and a second that highlighted only the snout and the mandible. In the case of Entierro 6, both types of preparation techniques were applied to the canid skeletons. Skulls that attempted to retain the entire cranium intact tended to exhibit abundant cut marks on the skulls with clear fractures and cut marks along the dorsal opening of the braincase (n=4). In this case, skull processing probably occurred while the bone was still green and its pelt, meat, tendons and other products were still attached to the skull. The cranium and the corresponding mandible were often disarticulated to further process the mandible, sometimes cutting off the ramus to keep only the body and tooth row in place. The highly praised pelts of these carnivores were extracted from the entire skeleton, even scraping around the digits, leaving cut marks on the phalanges and claws. It was in this manner, as bare bones, that the skulls and sometimes their corresponding paws entered the ritual scene.

On the other hand, prepared snouts from the same context demonstrated very little evidence of cut marks (n=3). In two cases, cut marks were documented on the body of the mandible (Elemento 2229) and on the frontal region of the cranium (Elemento 2221). In this case, it was impossible to distinguish if the elements were prepared post-deposition or while the bone was still green but the presence of cut marks suggests that at least the pelt was still attached when they were processed.

Entierro 3's production procedures favored more compact forms reducing the cranium to its snout. There was much more consistency in the preparation techniques compared to Entierro 6 despite the fragmentary evidence. These crania were accompanied by the corresponding mandibles that were either deposited whole or reduced by discarding the ramus. In most cases, the snout and the mandible did not have a point of articulation and were most likely deposited disarticulated as bare bones.

The presence of cut marks on the skulls of Entierro 3 allude to the act of skinning, scraping along areas where the pelt comes to close contact with the bone. However, due to the very scarce proportion of skulls with cut marks (n=2), it is likely that some of the skulls were collected and processed after the skin and other secondary products had already been removed. No weathering patterns confirm this hypothesis, but it cannot be rejected due to the overall abundance of highly fragmentary and processed specimens.

A wolf head from Ofrenda 2 closely resembles the processing technique of the former case in Entierro 6; the entire head kept its original form only altering the occipital region. Abundant cut marks both on the cranium and mandible suggest that secondary products were removed as part of the production of these skulls; at which point the cranial-mandibular joint was detached as exemplified by the cut marks cutting along the edges of this joint. Nonetheless, their articular surfaces were kept intact, to be deposited correctly articulated in the offering chamber.

Eagles

Only Entierro 6 included secondary burials (n=9) of eagles. Life history reconstructions and production sequence of individual eagles from this context were already discussed in the previous chapter as many of the surface features closely resembled those encountered on primary burials. In this manner, they were prepared to look somewhat complete, sometimes undergoing taxidermic preparation, and thus should be analyzed in conjunction with the primary burials. Therefore, this section only briefly discusses overall element and cut mark distributions to be able to compare this assemblage to other species.

Element distribution

While many of the secondary burials were semi-complete demonstrating an overall even body part distribution, there were particular portions of the eagle's body that were repeatedly used: the cranium/mandible, the wings, the digits and the talons (Figure 6.14). The overlap analysis only totaled eight individuals because Elemento 2222, drawn in the field as consisting of several long bone fragments,

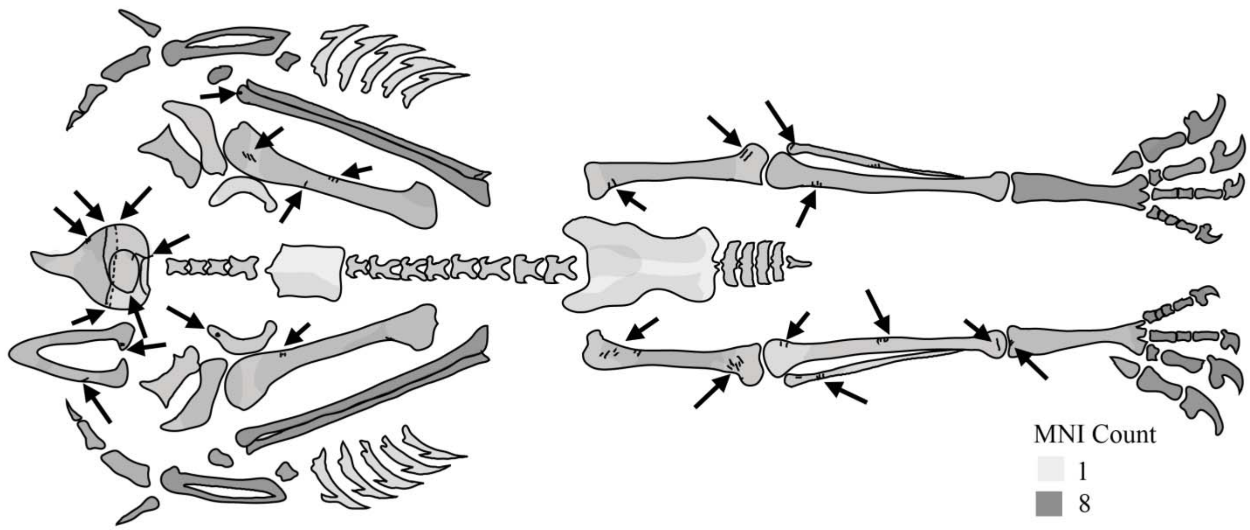


Figure 6.14 Overlap analyses of the secondary eagles from Entierro 6.

was so fragmented that it was impossible to draw the fragments onto a template that requires identifying the element and its exact location. Nonetheless, the precise mapping of each of the Elemento numbers confirms that 18 individuals were distributed throughout the dedicatory chamber, nine of which were placed as secondary deposits.

Unlike canid and felid secondary deposits that concentrated on their heads, sometimes including its claws and phalanges, the eagles were produced emphasizing body parts related to locomotion in addition to its head. In some cases, this distinct element distribution was used as evidence of taxidermy, preserving the body's complete appearance. One of the main reasons for the focus on the wings was probably because the long feathers attached in this area were highly valued commodities. Similarly, the powerful symbolic value of the eagle's greatest weapon, its long talons, signified the important aspects of this raptor. A similar element distribution was found among other avian species.

Surface Modification

Six of the nine eagles presented cut marks or perforations recording the processing techniques applied to the skeleton. Perforations mark body parts that were altered to keep skeletal integrity, and this was identified on the shoulder girdle of Elemento 2246 and the distal end of the ulna of Elemento 1983. Cut marks were distributed along the cranium, mandible, humerus, femur, tibiotarsus, fibula and tarsometatarsus bones on multiple individuals recording areas where dismemberment occurred and/or meat or other soft tissues were extracted (Figure 6.14). The abundant evidence of alterations along the occipital region of the eagle's cranium was to extract the encephalic mass from the braincase. Variations in the processing technique included round circular opening at the occipital region, large orifice extending from the foramen magnum, and transversal cut along the nuchal crest.

A few of cut marks were also found on the mandible, although this was relatively rare in comparison to the abundant cut marks present on canid and felid mandibles. Although many of the surface alterations were placed along the ends of long bones, between the diaphysis and the shaft where many muscles and tough tendons attach, there were a couple of cut marks along the medial shaft. The latter pattern is usually associated with meat extraction, suggesting that in some cases the eagle's carnage may have been removed. In comparison only one specimen exhibited cut marks along the articular surfaces, between the tibiotarsus and tarsometatarsus, suggesting that very few animals were dismembered. This diverse patterning demonstrates a variety of preparation techniques; some individuals retained skeletal integrity with no dismemberment, some had meat and other secondary products removed, while others were taxidermically prepared to look complete.

Only one cut mark was present on the left radius of Elemento 2193, argued to be taxidermically prepared. With this exception, all other eagle wings did not contain cut marks. The wings is where large flight feathers attach and were the elements best represented in the collection; together this pattern suggests that their feathers were attached at the time of deposition. Unfortunately this hypothesis cannot be confirmed because feathers could easily be plucked and leave no surface features. It is certainly well documented that feathers were plucked from captive birds in both other zooarchaeological and ethnographic case studies (Chapter 9).

Reconstructing secondary eagles

As the more individualistic analyses of these raptors explored in Chapter 5 demonstrated, there is variability in the secondary deposits of raptors found in Entierro 6. Some individuals were deposited while the corpse was still articulated despite evidence that secondary products (meat, tendons, soft tissue and feathers) were extracted. Others probably were prepared artifacts, possibly feathered capes that emphasized its wings. At the same time, some of the eagles were prepared taxidermically, stuffed to keep skeletal integrity as they participated in the ritual spectacle. Being the most abundant case of golden eagles deposited in any singular context during the Teotihuacan occupation, it is understood that such secondary deposits accompanied the primary sacrificial victims to complete the eighteen eagles necessary for the event. The heterogeneity in the processing techniques of the secondary deposits found go hand in hand with the variability observed in primary burials. Complex life histories foretold in Chapter 5 demonstrated that both sacrificial victims and prepared animal paraphernalia interacted with the Teotihuacan populace to differing degrees, some with pathological indicators of captivity, while others did not leave zooarchaeological traces of human-animal interactions.

Other Avian and Non-Local Fauna

In contrast to the redundant use of key species in primary burials, several other avian and non-local fauna were identified among secondary deposits. Such species diversified the offerings and represent secondary icons utilized in state rituals. They included various raptors (hawks, owls and falcons), ravens, and other game birds like the Columbidae (dove/pigeon) or the quail (Table 6.1). Furthermore, the discovery of the spider monkey in Entierro 5 was both unexpected and difficult to contextualize. It highlights the participation of a very distinct non-local species in state-rituals unrecorded thus far at this site.

Most of these individuals were not primary burials but were represented by a suite of elements that were semi-complete or were deposited as isolated skeletons; presumably to deposit not only their bones and teeth but also other secondary resources such as its feathers. This demonstrates that key species designated as appropriate sacrificial victims were restricted, deliberately avoiding the use of other animals for state sacrifices. These other species were most likely supplementary ritual paraphernalia that accompanied restricted iconic animals.

Perhaps because they were not primary burials, or because the remains were simply too fragmentary, there was very little information gathered from the surface features. Only one crow from

Table 6.1 Summary of other avian remains from all offering contexts.

Elemento #	Specie	Age	Sex	Surface	Body Part	Notes
Entierro 2						
38.2	*Bubo virginianus*	UnID	UnID	No	Isolated wing bone	Looks like 126.3, but since this individual already same element, the MNI for Bubo virginianus is 2.
126.3	*Bubo virginianus*	UnID	UnID	No	Mixed incomplete	Various elements throughout the skeleton. Hard to determine if it was complete, but at least included both extremities.
37	*Buteo* sp	UnID	UnID	No	Isolated wing bone	Right carpometacarpo.
81.3	*Buteo* sp	Adult?	UnID	No	Isolated wing bone	Complete left ulna. Was mixed in with bones of a eagle, Element 81. May be part of the stomach content or feathers attached to this bone.
126.4	*Buteo* sp	UnID	UnID	No	Both wings	Wing elements on both sides, and possibly phalnges on the feet.
38.1	*Buteo jamaicensis*	UnID	UnID	No	Right wing elements	Looks like Ele 37, but larger. Maybe male/female difference.
126.1	*Corvus corax*	UnID	UnID	No	Mixed incomplete	Extremities and some cranial fragments. Various axial elements mixed in bag. Probably was a complete or semi-complete individual.
126.5	*Corvus corax*	UnID	UnID	No	Both hindlimbs	Distal tarsometatarsus on both sides. Much smaller Corvus specimen, maybe of the common crow.
126.2	*Falco mexicanus*	UnID	UnID	No	Semi-complete	
91	UnID bird	UnID	UnID	No	UnID	Bone associated with a shell. Looks like it might be a coracoide of an eagle, but might be too small. Probably isolated element from another individual.
Entierro 6						
2056.1	*Colinus virginianus*	UnID	UnID	No	Mixed incomplete	Because there were two left mandibles we know there were two bobwhite quial.
2056.2	*Colinus virginianus*	UnID	UnID	No	Mixed incomplete	Because there were two left mandibles we know there were two bobwhite quial.
1982.1	*Columbina inca*	UnID	UnID	No	Both wings	
1982.4	UnID small bird	UnID	UnID	No	Mixed incomplete	Fragments of vertebrae and long bone.
2060	UnID bird	UnID	UnID	No	Mixed incomplete	Unidentified laminer bone, may be from an eagle.

Table 6.1 Continued.

Elemento #	Specie	Age	Sex	Surface	Body Part	Notes
Entierro 3						
565	Buteo sp.	Juvenile	UnID	Yes	Mixed incomplete	Wings not full developed, thus juvenile. Some cut marks on its extremities.
577.2	*Buteo magnirostris*	UnID	UnID	No	Isolated wing bone	Right carpometacarpo found mixed with canid head, Element 577.1.
575.3	UnID small bird	UnID	No	No	Isolated eye piece	Sclerotic eye-ring piece, maybe of an eagle. Because there are no eagles from this burial, may simply be from the fill or from another bird like the Buteo species found in this burial.
Entierro 5						
1446.1	*Buteo* sp.	UnID	UnID	No	Extremities only	Right humerus, right wing phalange 1, and parts of tarsometatarsus and phalanges of both hind limbs.
1318.1	*Buteo magnirostris*	UnID	UnID	No	Isolated wing bone	Right carpometacarpo only.
1457	*Buteo magnirostris*	UnID	UnID	No	Isolated wing bone	Left carpometacarpo only.
1492	Columbidae	Adult	UnID	No	Semi-complete	Probably was a complete individual.
1446.2	Columbidae	UnID	UnID	No	Right wing only	Right carpometacarpo and ulna.
S3E3.3	Columbidae	UnID	UnID	No	Isolated wing element and tail bone	Right carpometacarpo and pygostyle. Both 1492 and 1446.2 have a right carpometacarpo so MNI is 3 for Columbidae.
1637	*Corvus corax*	UnID	UnID	Yes	Semi-complete	Was probably a complete individual. Pathology on the the feet (phalanges) and left digit 3 on the wing.
PPS OF2						
155, 210, 312	*Buteo jamaicensis*	UnID	UnID	Yes	Cranium and extremities.	Cutmarks on the wing elements. Fracture in the back of the head. Might be taxidermically prepared?

Entierro 5 contained pathological indicators of injury. Very little information about the age and sex of the other avian fauna was available. Only two individuals were aged, both of which was generally considered an adult. This is because like eagles, age and sex categories are very difficult to determine for birds, particularly since they were incomplete.

Great horned owl (Bubo virginianus)

Only two owls were identified from dedicatory contexts, both of which were deposited in Entierro 2. While a semi-complete body composed of scattered elements of one raptor (Elemento 126.3) was recorded, the second raptor (Elemento 38.2) was represented by only one wing bone, the left first phalange. This isolated bone probably was composed of not just the osseous element, but also the feathers that attach in this area. The semi-complete body of a great horned owl was accompanied by the scattered elements of several avian species — hawks, raven and falcon — surrounding an eagle and human sacrificed on the eastern border of Entierro 2.

Hawk (Buteo sp.)

Entierros 2, 3 and 5 from the Moon Pyramid and Ofrenda 2 from the Sun Pyramid included *Buteo* sp. remains, either identified broadly to the genus or specifically as the roadside or red-tailed hawk (Table 6.1). In Entierro 2, hawk specimens were scattered in three different areas. Two individuals, one identified as *Buteo* sp. (Elemento 37) and another specified as a red-tailed hawk (Elemento 38.1) was found on opposite sides of a concentric montage of nine obsidian sacrificial knives. Elemento 38.1 included the right wing bones (carpometacarpus, phalange 1 and pollex) while Elemento 37 was composed of an isolated right carpometacarpus bone. Like the owl specimen, the reason wings were more abundant is probably because their feathers — highly valued components of ritual paraphernalia — attach on these bones. A concentration of hawk bones was situated to the east of the ring of bifaces and the associated hawks. Surrounding an eagle (Elemenot 127) several secondary birds were deposited including a hawk (Elemento 126.4) represented by both wings and possibly some of the digits on its feet.

Mixed with the remains of an eagle on the southeast corner of the same dedicatory chamber, Elemento 81.3, a complete left ulna of a hawk was identified. The eagle had consumed a rabbit and an unidentified small bird specimen, and this hawk may also have been fed to the animal. Another possibility is that the hawk ulna, together with its long flight feathers that attach on this bone, were deposited right next to or on top of the eagle. This interpretation parallels the eagle (Elemento 127), which was buried with other birds surrounding the primary burial and presents a more likely scenario.

The remains of a young hawk (Elemento 565) were identified in the western boarder of Entierro 3. On the humerus (both sides) and left tibiotarsus bone, several cut marks indicated that secondary products were extracted. The cuts on the humerus were placed along the proximal and distal shafts right next to or along muscle insertions suggesting that they were inflicted during meat extraction. The cut marks along the left tibiotarsus and the lack of the tarsometatarsus and their talons, suggest these cuts were placed during dismemberment.

Just to the east of this hawk, right carpometacarpus of a roadside hawk (Elemento 577.2) was mixed with remains of a wolf skull. The size of this carpometacarpus was smaller than Elemento 565 with a very distinct surface color and preservation, indicating this bone was probably from a second hawk that was placed in association to the canid skull, probably with its feathers still attached.

Entierro 5 also contained remains of *Buteo* sp. and the roadside hawk. Interestingly, they were also scattered in the eastern sector of the offertory chamber. Elemento 1446 was located to the north of the other two Elementos, which included its extremities. Just to the south of this, a right carpometacarpus (Elemento 1318.1) and a left carpometacarpus (Elemento 1457) of a roadside hawk were deposited. These two Elemento numbers were right next to each other and probably are from the same raptor. Again, there was a repeated emphasis on the wings.

In the western sector of Ofrenda 2, the partial remains of a red-tailed hawk were excavated (Elemento 155). The left ulna and radius were found isolated from the rest of the corpse, but due to the similarity in size, form and surface finish with the right wing bones, this was considered part of the same individual. Two areas were manipulated: the right radius and ulna contained cut marks along the shaft (see Figure 6.15b below) and the occipital region of the cranium was fractured, suggesting the encephalic mass was removed in a similar manner to some of the eagle specimens discussed above. A first glance at the element distribution — containing the head, both wings, and hind limbs starting from the tarsometatarsus downward — may suggest this individual was also prepared taxidermically like the eagles. However, because the left ulna, radius and tarsometatarsus were found isolated slightly to the south of the rest of the corpse, these elements were not articulated during deposition.

Bobwhite quail (Colinus virginianus)

Only Entierro 6 included remains of bobwhite quail (Elemento 2056). This included two left mandibles, a right mandible, cranial fragments, several vertebral fragments, right carpometacarpus and some hind limb elements. Because there were two left mandibles, there were at least two individuals. No other offering included this species and it is possible that these two birds entered as fill refuse.

Pigeon/dove (Columbidae)

This fowl was found in Entierros 6 and 5. In Entierro 6, the remains of both wings were identified as an Inca dove (Elemento 1982.1) while the remains of three birds identified as Columbidae were found in Entierro 5. Those from Entierro 5 varied from a semi-complete individual (Elemento 1492), the right wing bones (Elemento 1446.2), to the remains of isolated wing elements and tail bone (S3E2.3). It is unclear if these remains were part of the fill refuge or were offered.

Common raven (Corvus corax)

The raven was the only other bird besides the eagle identified as a primary burial (Elemento 1637) that was excavated from Entierro 5 (see previous chapter for description). Two more ravens were identified from Entierro 2 as prepared elements, demonstrating that ravens were also an important actor in state rituals. The pathology present on the raven sacrificed in Entierro 5 indicates the potential that other birds could have also been kept in the city confines as specialized animals reserved for ritual usage.

In Entierro 2, the remains of two ravens were mixed with those of other raptors placed around an eagle. They included mixed elements scattered throughout the skeleton (Elemento 126.1) — mainly composed of cranial, mandibular, wing and feet bones — and the remains of a second individual represented by the distal tarsometatarsus bones of both feet (Elemento 126.5). The second raven was distinguished from the first despite being identified in the same general heap of bones because it was much smaller in size and there was an overlap of these bones along the right tartometatarsus.

Prairie falcon (Falco mexicanus)

The remains of a semi-complete Prairie falcon were also jumbled with other raptor remains surrounding an eagle (Elemento 126.1) in Entierro 2. This included not just the cranium and extremities, but also fragments of the vertebral column that suggest the entire skeleton may have been present. Unfortunately, since all the raptor remains surrounding the eagle were recovered as a single Elemento number which included the skeletons of at least five raptors. This demonstrates that secondary and primary non-eagle raptors may have also accompanied the offerings.

Spider monkey (Ateles geoffroyi)

Surprisingly, the remains of a left distal humerus and left proximal ulna of a spider monkey were identified in Entierro 5. These two bones, along with some unidentified irregular and flat bone, were deposited just to the east of the sacrificed wolf. This was an extraordinary discovery which represents the second instance of this species ever reported at Teotihuacan (see Chapter 4). This is because spider monkeys are not local to the arid highland basin. Unfortunately, this secondary burial of the forelimb did not provide any surface features to help interpret how they were utilized or what the final product would have looked like. We can only say that it was likely from a young individual considering its relatively small size. Most likely, this forearm was brought into Teotihuacan and deposited bare.

Production of other avian remains

Looking at the element distribution of all secondary avian materials, there is an emphasis on key body parts such as its wings (Figure 6.15a). In some cases wing elements including the carpometacarpus, the ulna and the first phalange were found isolated, presumably because they are where long wing feathers attached. Another area with high instance of overlap is the beak of the bird, not including its braincase, and its long talons.

Cut marks and other surface features were very rare in comparison to mammalian materials and even among secondary eagle deposits. Only two individuals, both hawks

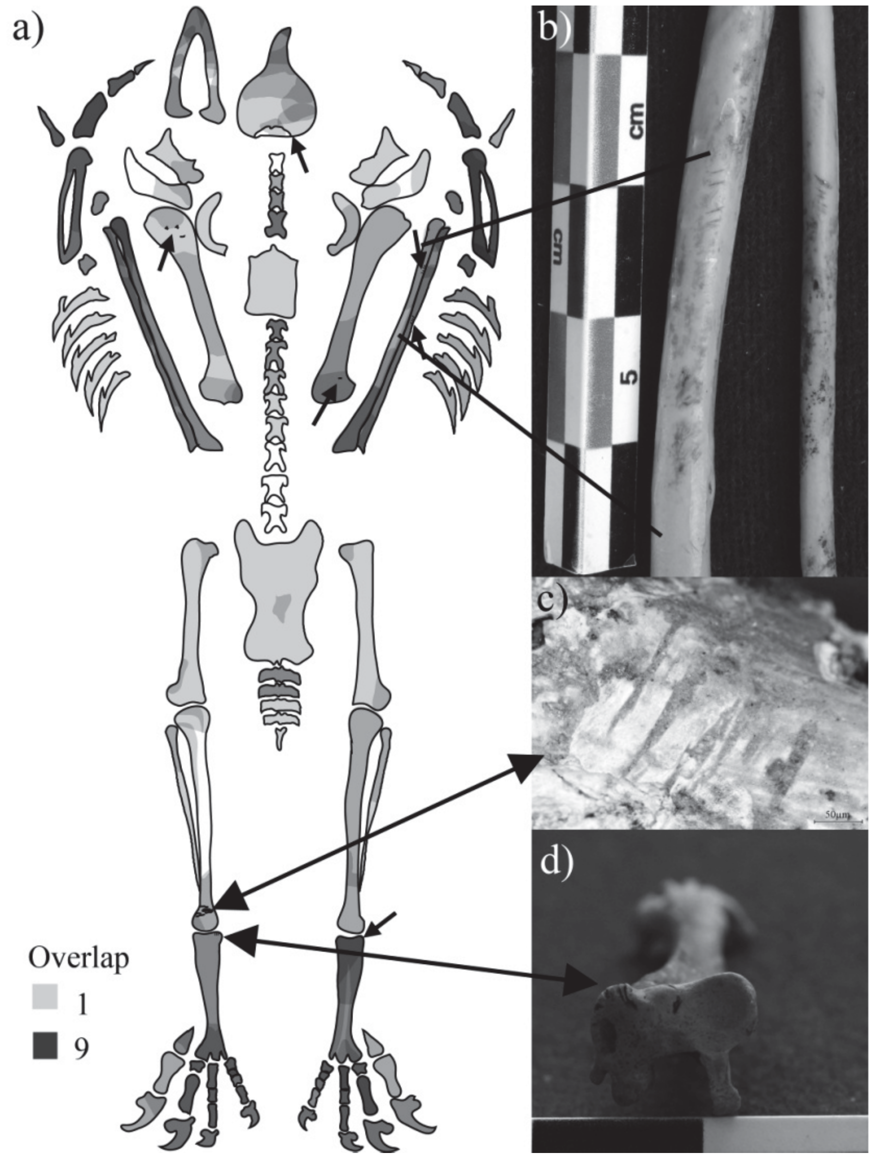


Figure 6.15 Secondary avian remains; a) overlap analysis of all species, b) close up of cut marks on left ulna and radius shaft of hawk, Elemento 155, Ofrenda 2; c) microscope photograph of cut marks on distal end of left tibiotarsus of hawk, Elemento 565, Entierro 3; d) deep groves on the proximal articular surface of hawk, Elemento 155, Ofrenda 2.

―Elemento 565 from Entierro 3 and Elemento 155 from Ofrenda 2― illustrated cut marks on its skeleton. These cuts were distributed around the humerus, radius, ulna, tibiotarsus and tarsometatarsus (Figure 6.15a). A fracture on the occipital region of the cranium of Elemento 155 confirm that in some cases the birds were prepared when the encephalic mass was still in the brain case, and cuts along the shaft of the ulna and radius demonstrate meat and other secondary products were also processed (Figure

6.15b). Repetitive grooves along the distal left tibiotarsus of Elemento 565 and the deep grooves along the articular surfaces of the tarsometatarsus of Elemento 155 suggest that these bones were disarticulated along this joint (Figure 6.15c,d). No other surface features (such as perforations) were recorded on these skeletons. Unlike mammalian remains with evidence of pelt extraction, avian products were probably deposited with its feathers still attached. This hypothesis is strengthened by the scarcity of cut marks and the abundance of wing bones.

Overall patterns in secondary burials

This chapter discussed a very distinct process in which the animals entered the ritual scene: as ritual paraphernalia. This section concludes the analysis of the production of faunal products by examining a comparative case study of the canid maxillary pendants discovered at the Feathered Serpent Pyramid, discussing the similarities and differences among different species, as well as looking at chronological trends in the products. From this information we can infer the function and meaning behind animal paraphernalia in state ritual performances.

Maxillary pendants from the Feathered Serpent Pyramid (FSP)

The only comparative example of ritual paraphernalia from dedicatory contexts at Teotihuacan come from the canid maxillary pendants discovered in the FSP. During the tunnel excavations of the main pyramid, mass sacrificial graves contained human, canid and imitation (shell) maxillary pendants (Sugiyama 2005:171-179). Individuals 4-A and 4-O possessed elaborate pendants made of canid maxillae along with other rich offertory adornments such as a pyrite disk with slate backing (*tezcacuitlapilli*), projectile points, and shell adornments (Figure 6.16). The presence of maxillary pendants of diverse sources, human, canid and even shell imitations of both human and canid dentition, demonstrates that maxilla in particular possessed special meanings, evidently associated with males that symbolized either mythological warfare and/or calendric meanings (Sugiyama 2005:177-179).

These canid maxillae were highly processed and intentionally manufactured, pulling teeth from multiple individuals. This is to say that each maxilla that made up the pendant sometimes included teeth extracted from multiple individuals, sometimes of different species. The eight maxillae analyzed from

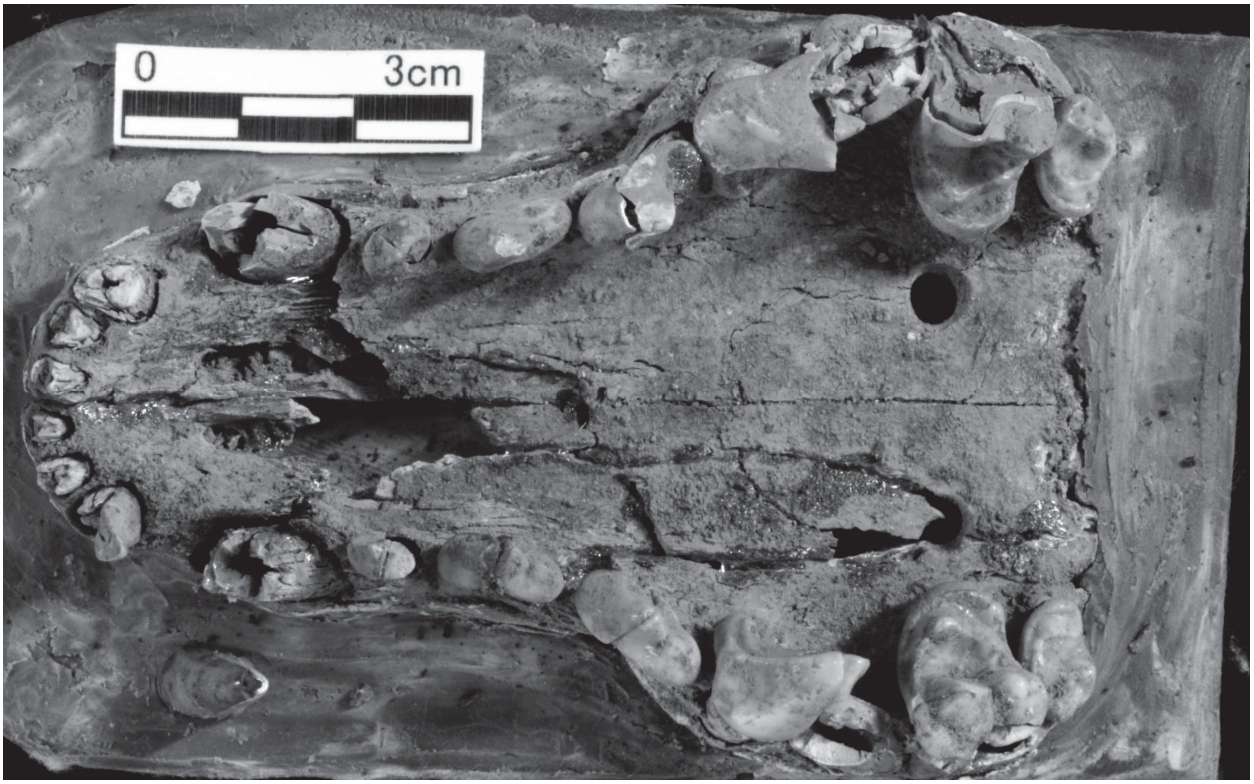


Figure 6.16 Canid maxillary pendant from the Feathered Serpent Pyramid (Photo N. Sugiyama).

individuals 4-A and 4-O were composed by joining teeth from fifteen individuals (Valadez Azúa, et al. 2002a) including hybrids between wolf and dog (n=8), other crossed-breeds (n=3) and an unidentified specie (Valadez Azúa, et al. 2002b).

This case study provides a useful comparison to the production of felid and canid heads at the Moon Pyramid and the Sun Pyramid. The possibility that felid skulls from Entierro 5 were made of composite figures, pulling teeth from multiple individuals to make a single object was mentioned in the above analyses. While the unfortunate destruction of the osseous structure in Entierro 5 prohibits any reconstruction of what these felid paraphernalia would have looked like, the canid maxillary pendants provides a possible hypothesis. Evidence of pulling teeth from multiple individuals provided by the FSP case gives weight to this hypothesis that felid heads were similarly elaborated as composite artifacts.

If this were the case, the visual effect of such composite artifacts ought to be considered. Certainly modern ethnographic masks amplify the mystical characteristics of wild animals by sticking teeth of multiple individuals, often of different species. A late post-classical mask from Northern Maya lowlands, for example, utilized four human and two felid or canid canines on a turquoise mosaic mask (Ishihara-Brito and Taube 2012:474). Modern ethnographic masks, for example jaguar masks from Guerrero, often implement deer, sheep, and goat teeth with canines of other species. The result is a highly mystical hybrid creature. While the felid composite figures were probably not masks because they retained their cranial and mandibular bones, the composite skulls containing extra teeth would have similarly emphasized a supra-natural mystique. Certainly the presence of cut canines, like Elementos 512 and 574.2 from Entierro 3, suggest the use of these teeth as isolated elements, possibly as adornment.

The manufacture of canid pectoral pendants at the FSP differed significantly to that discussed among materials from the Moon Pyramid and the Sun Pyramid because they lacked the mandible and only retained the maxilla. This is true not only for the canid materials from the FSP, but shell imitation and human maxillary pendants also only emphasized the maxilla. Hardly any frontal component of the canid maxillae were preserved and the lacrimal, nasal, zygomatic, and frontal portions were absent. The inferior aspect of the maxilla, the palatine, and its dentition were the only elements present. A transversal cut was placed along the palatal surface just dorsal to the second molar. Two large perforations on the maxilla were used to thread them into a pendant.

None of these modifications were present on any canid or felid maxillae. Perhaps the canid and felid assemblage in Entierro 3 provide the closest parallel, although these were much less elaborate, were not pectorals, and consisted of only bare canid skulls. These heads were scattered around the bodies of human sacrificial victims, probably demonstrating the close affinity between the canids and the identity of the humans similar to the warriors sacrificed at the FSP. While the connection between the maxilla and the Teotihuacan Primordial Crocodile as explained by S. Sugiyama (2005:179) is lost with the canid skulls, the close link between warrior captives and wolves is apparent in both assemblages.

Felid/Canid skulls

Comparisons between felid and canid skulls demonstrated shifts through time in the aesthetics and preparation techniques of mammalian skull paraphernalia. Canid and felid skulls exhibited two major patterns: 1) complete looking skulls with varying degrees of processing on the mandible and 2) those that emphasized only the snout of the animal with accompanying mandibles. The former case was mostly observed in early deposits — that is, Entierros 2, 6, and Ofrenda 2 — while the latter was practiced in later offertory contexts — Entierros 3 and 5.

Entierro 6 contained the greatest variability in the production techniques among both canid and felid remains. While the offering as a whole favored retaining the form of the neurocranium intact, there was a wide range in the extent of mandibular processing and abundance of cut marks. Such evidence indicates that there was relatively little standardization of the production process, both among species and within species. It is probable that the large number of animals incorporated into the dedicatory chamber did not permit just one workshop or artisan commissioned for this project to produce all of these skulls. Instead, they were likely produced from disparate workshops or artisans, each with its own production technique and style, to gather the required number of felid and canid skulls that were predetermined by their cosmological significance.

In contrast, Entierro 3 despite being the context with the highest MNI of prepared felid and canid skulls (n=24), demonstrated the most consistent pattern in preparation techniques. This may be because these prepared heads played a more central role in this offering that did not include any primary animal burials and because they directly alluded to the identity of the human captives sacrificed. It is very likely that Entierro 5 also exhibited similarly standardized processing techniques, but the fragmented bones do not allow for this reconstruction.

Inter-species differences in preparation techniques between these two mammalian groups demonstrated some interesting differences; cut marks on the canids were usually characterized by long and deep bands in comparison to the lighter and shorter striations left behind on felid crania (Figure 6.2 versus 6.10). As a case in point, let us examine the canid Elemento 2194 and jaguar Elemento 1960, both of which extracted the encephalic mass through a dorsal opening cutting along the nuchal crest to the occipital sector (Figure 6.17). They each presented cut marks to varying degrees, particularly on the parietals for the canids and on the zygomatic arch and along the inferior surface for the felid. Such variation highlights the heterogeneity in processing techniques between species, probably due to the

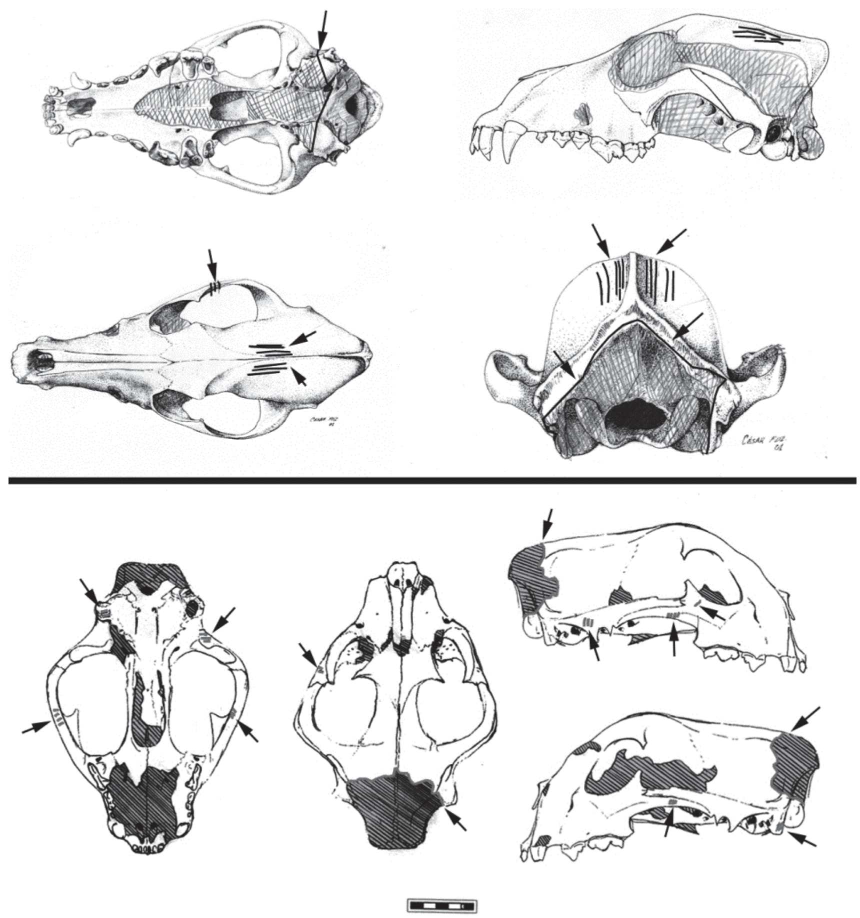


Figure 6.17 Comparison of cut mark and element distribution of wolf, Elemento 2194 (above) and jaguar, Elemento 1960 (below).

anatomy of the animal in relation to musculature and processing techniques, but also due to differences in manufacturing groups.

Eagles/Other birds

There were significant differences in the production of eagles versus all other avian deposits. Compared to the somewhat even body-part representation of eagles from Entierro 6 that attempted to keep skeletal integrity, sometimes even taxidermically prepared, other birds only retained the wings, feet and beak (Figure 6.14 versus 6.15). Distribution of surface features on the eagles were more abundant, with six out of the nine secondary deposits containing cut marks, perforations and fractures, while only two of the twenty other birds exhibited traces of modification. This suggests that in the case of eagles, they were prepared while the feathers, meat, tendons and other soft tissue were still attached requiring appropriate extraction and/or preservation procedures. On the other hand, most of the other birds were probably collected after such soft tissue was already absent or were prepared with non-intrusive methods that did not leave surface markers. Often just a portion of the wing was deposited, which would be easily extracted without needing to leave tool marks when the feathers were left attached onto the bone. This suggests that producers came in contact with the eagle skeletons while the animal was freshly killed, in contrast this was not necessarily the case with other avian remains. This also highlights the efforts made to keep the skeleton articulated among eagle skeletons that was not observed among other avian remains.

Mammals/Birds

The body part distribution of avian specimens (eagles and other birds) differs greatly from other mammalian artifacts (canids and felids); the former emphasized body parts relating to locomotion including the wings, feet, as well as the beak while the latter utilized the head, sometimes their claws/phalanges. Some scholars have emphasized that body parts alluding to the sensory experiences, such as hearing, seeing, smelling and tasting are located on the head, and so it is not surprising that these bones would be most abundantly represented in ritual deposits (McNiven 2010). Heads or the lack of heads are noted in many archaeological case studies in offerings, foundation deposits, hunting shrines, and in sacrificial pits (e.g. McNiven 2010; Meskell 2008; Russell 2012a). From a iconographic stance, it has been suggested that bodiless heads are among the most common icon in Classic Maya paraphernalia (Kubler 1969:29). This was also the case among human sacrificial rites at Teotihuacan. For example, the heads of warrior captives were deposited in Entierro 4 while the bodies of headless sacrificial victims were present in Entierro 6 (Sugiyama and López Luján 2007). For mammalian remains, the head was an integral referential to the identity of the animal and was the means through which interpersonal dialogues were exchanged as argued by McNiven (2010). This is manifested in the mammalian skull assemblages from the Moon Pyramid and the Sun Pyramid, as well as the canid maxillary pendants from the FSP.

On the other hand, the element distribution of the avian remains demonstrates that birds were referenced utilizing other body parts. No doubt their capacity for flight was part of their identity and it is not strange that their long flight feathers and its wing bones were central to their identity. Similarly the long talons and the distinct beak would have been key features that identified the skeletal remains as birds, especially for the raptors found in this cache.

Chronological Trends

The analyses of secondary deposits from the dedicatory caches help interpret what the actual faunal artifact would have looked like, how they contributed to the ritual performance, as well as how the values and meanings of the objects were created through reconstructing the ritualized production process. It is clear that this process was distinct for each species and for each of the contexts.

Although Entierro 2 was constructed during the fourth building episode like Entierro 6, their secondary deposits were distinct from Entierro 6. No secondary deposits of canids were present, while felid skulls with their pelts completely removed were placed in the offering. These heads would have retained most of their brain case, making them look somewhat intact. None of the eagles were prepared secondarily and the remains of hawks, owl, raven and falcon identified in Entierro 2 were not found in Entierro 6. While the characteristics of primary sacrificial victims between these two offerings were fairly similar, this distinct approach to the use of secondary deposits is noticeable. In this context, primary deposits were central faunal deposits while other secondary remains, mainly of avian and felid species, were scarcely found.

Entierro 6 contained the most variation in canid, felid, and even avian preparatory processes. Unlike many of the offerings that focused on secondary deposits, like Entierros 3 and 5, Entierro 6 contained relatively comparable number of primary and secondary burials—34 sacrificed animals versus 30 utilized as ritual paraphernalia (excluding rabbits, other small mammals, and unidentified birds that are either stomach contents or fill refuge). Unlike Entierro 3 that focused mainly on canid heads and Entierro 5 that contained abundant felid skulls, Entierro 6 included abundant secondary remains of different species including canids, felids, eagles, bobwhite quail, and Inca dove.

The degree of processing varied significantly in Entierro 6, particularly among mammalian remains that included some skeletons prepared to look complete while others were more extensively processed. Isolated phalange/claw assemblages may signify that apart from the skeletal remains of skinned felids and canids, their pelts may have also been deposited separately. Eagles and other avian species similarly demonstrated heterogeneity, as some were left to maintain skeletal integrity, sometimes even taxidermically prepared while still others placed isolated wing bones, presumably with their feathers still intact. The heterogeneity present in the secondary burials in Entierro 6 is not surprising given the quantity of faunal remains that were prepared for this ritual spectacle. These products were most likely acquired from multiple locations that were produced with diverse manufacturing procedures reflected in the element distribution and their surface features. At least in the case of secondary eagles, the ritualized production process included the capture and maintenance of these animals for ritualistic purposes (see previous chapter). Similarly, other animals utilized for secondary purposes may have also been kept in captivity as supported by isotopic data (Chapter 7).

Entierro 3's secondary assemblage obviously focused on canid skull products as main icons that were closely associated to the human sacrificial victims. Compared to the varied canid skull assemblage from Entierro 6, canid head processing was much more standardized. It emphasized the snout, cut marks were scarce, and may represent reworking of already decomposed skulls that required no pelt extraction. On the other hand, this may indicate that the pelts were still attached to the snout, which would also explain the lack of cut marks from this assemblage. While this assemblage differed significantly from the canid maxillary pendants from the FSP in manufacturing techniques, the association of these wolves with the identity of the captive warriors is apparent. Apart from these canid remains, the felid skulls deposited in this context also exhibited similar patterning that only emphasized the snout of the animal. Such standardization among these species in this context despite the abundance of cranial elements suggest that there was more specialized production from a restricted source. Perhaps by this time there was a convention of the proper form for ritual paraphernalia or its production was more restricted.

Unfortunately, secondary deposits from Entierro 5 were much harder to reconstruct due to the fragmented zooarchaeological record. One aspect that is clear is that there was a focus on felid paraphernalia, particularly in the form of composite figures, possibly pulling teeth of multiple individuals to form one cluster. Many phalanges and claws of felids were also scattered throughout the offering, some of which would have probably been attached to their pelts. Two of the humans deposited in this cache held animal products; one of them carried the only canid skull from this context, while another held a felid head. Most likely these crania would have resembled the prepared skulls that only contained the snout with a processed mandible like that found in Entierro 3. They were closely linked to the individuals that held these skulls (see Chapter 8). Hawks would have entered the scene as feathered wing elements, and in one instance was deposited with its feet (tarsometatarsus and talons) possibly as a feathered cape. Interestingly, one forearm of a spider monkey was also included in the offering, although no surface features helped interpret if this was prepared in any way. Most likely the bare bones of this monkey were deposited as isolated elements procured from a non-local source.

Three prepared skeletons were deposited in Ofrenda 2 at the Sun Pyramid. The felid and canid both retained much of its braincase and abundant marks demonstrate these elements entered the scene as bare bones similar to the canid and felid skulls described in Entierros 2 and 6. The remains of the red-tailed hawk indicate dismemberment and preparation along the wing and tarsometatarsus; these bones may have entered the ritual scene bare unlike the eagles prepared in Entierro 6.

Ritualized Production

This chapter described the material traces of faunal ritual paraphernalia found in the dedicatory chambers. The results demonstrated a shift from a heterogeneous manufacturing technique for multiple species, mainly observed in Entierro 6 but to some extent Entierro 2 and Ofrenda 2, to a move towards implementing a more standardized production sequence observed in Entierros 3 and 5. There is also a shift from using species prepared secondarily in somewhat balanced distribution — Entierros 6, 2 and Ofrenda 2 — to utilizing key secondary icons — Entierro 3 that emphasized canids and Entierro 5 that emphasized felids.

It is important to realize the interaction between producer and the animal product, in this case consisting mainly of the same highly symbolic animals as those elected for ritual sacrifice. Furthermore, the presence of other secondary avian species not found in primary contexts highlights another subset of animal actors. These animals would have supplemented the primary species reserved for ritual sacrifice, while adding more diversity and unique expressions in the ritual spectacle.

In some instances secondary paraphernalia were an integral component of constructing the identity of the sacrificed humans and orienting the ritual scene. Most likely the canid affiliation expressed in Entierro 3 defined their entity as warriors, maybe even of a specific clan. Similarly the secondary products of felid skulls in Entierro 5 surrounding one of the three sacrificed humans also alluded to the identity of the victim. It is important in such cases to be able to interpret the complete ritualized production process of the animal, parts of which can be reconstructed through the zooarchaeological assemblage. The production process may have originated from the capture and maintenance of the animal in the city confines, as was observed among some of the secondary eagles. It remains to be confirmed if this was the case for other secondary products lacking zooarchaeological indicators of this interaction. However, it is important to keep in mind that much information is lost by examining only the zooarchaeological record. For example, avenues not addressed in this study are: what were other ritualized production processes not observed in the zooarchaeological data that helped animate these ritual paraphernalia (dancing, singing, performing, etc.). It is also important to understand these two datasets together to ask if the differences observed in primary versus secondary burials are meaningful to understand its role in state ritualized performances.

CHAPTER 7

Isotopic Evidence: Animal Captivity and Diet

Carbon and nitrogen isotope ratios of human and faunal collections have been used to reconstruct animal and human diets in both modern and ancient contexts (DeNiro and Epstein 1978; Deniro and Epstein 1981; Schoeninger 2009; Schwarcz and Schoeninger 2011; White 2004). Particularly relevant to the present discussion is the extent to which paleodietary reconstructions can illuminate degree of human-animal interactions. For example, the domestic dog, which is an omnivorous scavenger, are often utilized as a proxy that reflects the human diet (e.g. Allitt, et al. 2008). Therefore it is no surprise that dog isotopic composition in Mesoamerica illustrated that a large proportion of their diet included C_4 resources (plant type distinguished by its photosynthetic pathway, see details below) as a result of human reliance on maize as a staple (White, et al. 2001b; White, et al. 2004a). Similarly high degree of C_4 input (up to 97%), presumably maize, in the diet of captive macaws and turkeys have been a useful indicator that they were kept, even bred in captivity (Rawlings and Driver 2010; Somerville, et al. 2010).

Syanthropists or animals that prefer disturbed vegetation often co-habit human settlements, often exploiting milpas and other agricultural products that heighten human-animal interactions (Pohl 1977; Reina 1967; White 2004). Such animals, like the peccary and deer, have been identified due to having a mixed diet of C_4 and C_3 (another plant photosynthetic pathway) grasses, consuming higher degree of maize in their diet than their wild counterparts (White, et al. 2004a). These contrast to other animals that have a predominantly “wild” signature with very little C_4 input, including deer and peccary that were probably hunted in more forested non-disturbed habitats, and feral dogs. Thus, isotopic analysis has recorded a continuum in $\delta^{13}C$ values from wild, predominantly C_3 diets, to domesticated/bred animals with very high C_4 based diets.

Correlated to the increased reliance on C_4 based diet among dogs at the site of Colha was a decrease in the nitrogen values, suggesting lower levels of carnivory (White, et al. 2001b). These case studies demonstrated that captive, artificial feeding may also be recorded by increased levels of omnivory that can be detected through the nitrogen isotopic ratio.

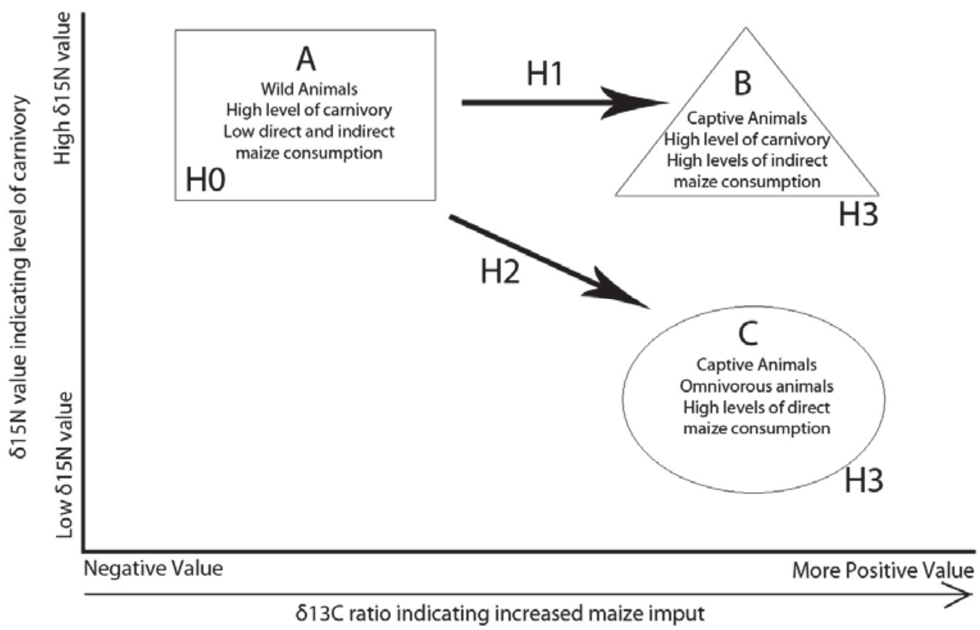


Figure 7.1. Model of relationship between δ^{15}N and δ^{13}C values of wild (A) and captive (B & C) signatures.

This chapter focuses on a paleodietary reconstruction of felids, canids, eagles, and rabbits utilized in primary and secondary deposits from offertory chambers in order to recognize similar evidence of artificial feeding. Based on available zooarchaeological evidence, it was hypothesized that there was a heterogeneous population whereby primary burials were composed of some animals kept in captivity for prolonged periods of time while, for the most part, secondary deposits represented fauna that were hunted in the wild. Presumably, such animals brought into the metropolitan center would have been fed either; 1) small game (probably rabbits since they are found in the stomach content) raised in Teotihuacan presumably on a maize diet among the specialized carnivores, or 2) a mixed diet with other vegetal materials such as maize to species that tolerate omnivory (canids). This is a hypothesis that can be tested through examining the carbon and nitrogen signature as they signal the incorporation of C_4 (presumably maize) based diet and the level of carnivory respectively.

In addition, isotopic data can determine changes in the diet through examining teeth—which mineralize only once during early stages of development— and bone —that remodels continuously and fuses much later in life. As such, four testable hypotheses are presented (Figure 7.1); H_0) wild animals were hunted (teeth and bone values=A), H_1) wild animals were captured, then kept in captivity that led carnivores to either consume maize indirectly through the herbivores that they were fed (teeth=A, bone=B), or H_2) by tolerating an omnivorous diet that included vegetal materials (teeth=A, bone=C), and H_3) carnivores for ritual purposes were bred in captivity (teeth and bones=B or C). We would expect different strategies be applied to different species (H_1 for specialized carnivores, H_2 for those that can tolerate omnivory). This analysis can characterize what proportion of the animals were kept in captivity and the duration of their confinement. In continuation, the methodology is explained and the dataset presented in order to look at overall patterns in paleodietary reconstruction of ritualized fauna.

Isotopes as a Proxy of Diet

Paleodietary reconstructions utilize the ratios of certain isotopes ($^{13}C/^{12}C$ and $^{15}N/^{14}N$) in preserved tissue to disentangle the relative proportions of different types of resources in the diet. Such ratios are expressed as delta values ($\delta^{E}X$) in parts per mil (‰), reflecting the ratio:

$$\delta^{E}X = R_{sample}\text{-}R_{standard}/R_{standard} \text{ x } 1000$$

(X= C or N, E=13 or 15 respectively, and R= the ratios of $^{13}C/^{12}C$ and $^{15}N/^{14}N$)

As different tissues form at different rates with varying degrees of preservation, interpreting what time frame the isotopic ratio reflects is dependent on understanding the physiology of the tissue examined. In this case, we were able to extract isotopic ratios from collagen and apatite of bone and teeth. Teeth are formed during infancy and/or early adolescence, while bone remodels as a constant rate depending on the skeletal element, species, and age of the individual. In the case of humans, for example, bone collagen turnover rate averages around ten years that varies based on the element and portion of bone examined (Schwarcz and Schoeninger 2011). In some cases, such as hair that grows incrementally, very detailed life history reconstructions are possible (e.g. Wilson, et al. 2007). The present study examined both teeth and bone to detect changes or continuities in the isotopic signature over the life span of the animal.

Bone is made of organic (collagen) and mineral (apatite) components; each provides information about different isotopic elements. Carbon and nitrogen isotopic ratios are extracted from collagen while carbon and oxygen isotopic ratios are read from apatite. While both collagen and apatite was analyzed in bone, only apatite data was gathered from teeth specimens because enamel is made primarily of hydroxyapatite with only negligible protein content. Analysis particularly focused on carbon (from apatite and collagen) and nitrogen isotopic ratios for interpreting the dietary composition of the fauna analyzed, while the O isotopic signature is only minimally discussed.

Carbon isotopes

In the case of carbon isotopes, variation is based on the type of photosynthetic pathway of the plant. The calvin cycle (C_3) photosynthetic pathway is characterized by three carbon molecule reduction process of atmospheric CO_2 found in trees, shrubs and temperate grasses that are characteristic of most wild and cultivated plants of temperate, tropical or subarctic regions (values range around -26.5‰) (O'Leary 1988; Smith and Epstein 1971). A four carbon molecule oxaloaetate found among tropical grasses are based on a Hatch-Slack cycle (C_4) mainly distributed in warm, arid to sub-arid regions (values around -12.5‰) (O'Leary 1988; Smith and Epstein 1971). Crassulacean acid metabolism (CAM) plants are characteristic of all succulents found in hot, arid environments, such as agave, nopal cactus and other cacti that are available in the arid highlands of Mexico (their values range between C_3 and C_4 plants, overlapping more with C_4 values) (O'Leary 1988; Smith and Epstein 1971). The carbon isotopic ratio then, provides the weighted average of these different plant types into the diet of the organism (DeNiro and Epstein 1978; van der Merwe 1982). It is thus important to define what food resources these ratios are pointing towards and their relative proportions of the total diet.

While there are other common plant resources consumed in the Mexican highlands that are C_4 grasses, such as the amaranth (*Amaranthus spp.*) and epazote (*Chenopodium ambrosodies*) (White 2004), maize (*Zea mays*) was the dominant staple consumed throughout Mesoamerica (Morales Puente, et al. 2012). While it is easy to simply correlate C_4 based dietary input as a direct indication of maize consumption, cautionary evidence report high amount of biomass in the Valley of Oaxaca (also an arid highland habitat) was composed of non-maize C_4 grasses (Warinner, et al. 2013). The Basin of Mexico probably also contained similarly high, or even greater varieties of natural C_4 grasses that could have been consumed by the animals. However, this study examines carbon isotopic ratios of a large population and the relative difference between groups (species, primary/secondary burials, etc.). The isotopic ratios presented in the study are not reliant on the fact that the C_4 proportion of the diet was composed of only maize, but that it was significantly altered from other groups.

Distribution of isotopic carbon ratios signify the composition of C_3, C_4 and CAM plants into the carnivores' diet through two dietary pathways: direct consumption or an indirect reflection of the vegetal composition of their prey (Ambrose and DeNiro 1986; DeNiro and Epstein 1978; Krueger and Sullivan 1984). As some carnivores tolerate some level of omnivory, it is important to distinguish between these two sources of carbon input. This can be accomplished by looking at the two sources of carbon — collagen and apatite— to create dietary models.

The inorganic bone phase, bone apatite, derives its carbon content from the blood biocarbonate while bone collagen is responsive to bone growth and turnover of the protein matrix (Ambrose and Norr 1993; Froehle, et al. 2010; Kellner and Schoeninger 2007; Tieszen and Fagre 1993). Controlled feeding experiments on animals demonstrated that bone apatite tracks overall diet while the collagen is more responsive to the dietary protein source (see summaries in Ambrose and Norr 1993; Kellner and Schoeninger 2007; Tieszen and Fagre 1993). Thus different components of the bone signify distinct aspects of the diet. This is why both collagen and carbonate data were examined in this study.

Nitrogen isotopes

The nitrogen isotopes of an organism are influenced by the nitrogen composition of its diet (Deniro and Epstein 1981; Schoeninger, et al. 1983). Nitrogen is incorporated into food webs from atmospheric N_2 present in the soil starting at a very low level (almost 0‰). N fixing leguminous plants have much lower $\delta^{15}N$ values close to 0‰ while other plants process N through fractionation in their roots and stems, enriching the $\delta^{15}N$ values by 2-6‰ (Delwiche and Steyn 1970; Virginia and Delwiche 1982). Marine animals contain significantly higher $\delta^{15}N$ values because of high degrees of nitrate and particulate organic matter present in the ocean as well as the denitrification processes (Price, et al. 1985; Schoeninger and DeNiro 1984). Soil nutrients, root depth (deeper rooted plants tend to be more enriched in ^{15}N), use of xeric versus mesic habitats, and the trophic level also affect isotopic nitrogen (Ambrose 1991; Kelly 2000). Other sources of variation unrelated to diet include, body physiology, environment (arid/humid), nutritional stress and soil conditions (especially due to intensive agricultural practices) that can sometimes surpass trophic level differences in the $\delta^{15}N$ value (Ambrose 1991; Hobson, et al. 1993; Warinner, et al. 2013). Weaning can also enrich the nitrogen ratio. Human and animal babies can contain $\delta^{15}N$ values up to one trophic level higher than the mother's (Fuller, et al. 2006). Thus individuals in the weaning stage should be evaluated separately.

The trophic level effect (TLE) is the result of preferential preservation on heavy isotopes with each trophic level that is recorded in both carbon and nitrogen values. This variation is fairly subtle with carbon ratios (about 1‰ enrichment) (Kelly 2000; Schoeninger 1985) but an average of 3-4‰ enrichment occurs with nitrogen for each trophic step (up to 6‰) (Ambrose and Norr 1993; Hedges and Reynard 2007; Kelly 2000; Schoeninger and DeNiro 1984).

Within terrestrial ecosystems, levels of carnivory can be assessed through $\delta^{15}N$ values as a result of the imbalance between dietary input and output that is accentuated with each trophic level (Minagawa and Wada 1984; Schoeninger 1985; Schoeninger and DeNiro 1984). Thus herbivores' $\delta^{15}N$ value is around 3-4‰ more than their diet (plants), carnivore's $\delta^{15}N$ value are 3-4‰ more enriched than that of an herbivore, while an omnivore's diet would range between these values based on the level of carnivory (Schoeninger and DeNiro 1984). Among humans, such investigations have successfully distinguished levels of meat consumption, often associated with gender and status differences (Somerville, et al. 2013).

The Oxygen Signature: Environment and Migration

Oxygen isotope values, expressed as $\delta^{18}O$, are used to reconstruct past environmental conditions. Such interpretations are based on the assumption that $\delta^{18}O$ signatures reflect the isotopic composition of the local water sources ingested by the organism. These water sources vary depending on the climate and geography of the region (altitude, latitude, humidity, temperature, and distance from the sea) (Ayliffe and Chivas 1990; Poage and Chamberlain 2001). As these factors are regionally specific, oxygen isotopes also record migration of both fauna (Hobson 1999; Wassenaar, et al. 2009) and humans (Stuart-Williams, et al.

1996; White, et al. 2001a; White, et al. 2000; White, et al. 2002; White, et al. 1998)(Kilingley 1980; Knudson and Price 2007).

Examining isotope signature of bone apatite provides simultaneous $\delta^{13}C_{apaite}$ and $\delta^{18}O$ values. Thus the below analysis of the isotope signatures from Teotihuacan briefly discusses the $\delta^{18}O$ values corresponding to each sample. However, due to the focus on paleodietary reconstructions in this study, the oxygen data is not interpreted in much detail. This is because many factors of the local water sources and the animal's physiology must be understood in order to interpret the results. In future studies, the oxygen results will be examined to reconstruct the movement of animals on the landscape, as some of the species included in the offertory caches were of non-local origin.

The Sample

As different species have varying teeth eruption sequence and bone remodeling rates for each element, the sampling strategy attempted to standardize the bone/tooth selected for each species. However, variations in preservation and curator practices that attempted to keep the skeleton complete did not always permit completely standardizing the sampling strategy. It was important to select elements that visually were not noticeable when mounted, as many of these individuals have been or will be displayed in museums. Nonetheless, the number of individuals sampled (n=83), the percentage of the population sampled (69%) (Table 7.1), and the quantity of bones and teeth sampled (n=142) (Table 7.2) make this a representative sample.

When feasible, felid and canid bones and teeth were extracted from each individual in order to detect changes in the isotopic signature through time. Felids were extensively sampled, representing the largest isotopic dataset from this study both in the number of individuals sampled (29 out of 50 individuals) and the number of specimens processed (n=62). When feasible, a premolar (maxillary Pm3 or Pm4), an incisor (usually I3), and a cranial fragment was collected, along with a long bone fragment if the felid was a primary burial. Although cranial fragments are not the ideal sample, as the majority of the felid assemblage consisted of incomplete heads, cranial pieces with preserved cortical bone were sampled. Almost all felid primary burials were sampled (seven out of eight), with the exception of one very badly

Table 7.1 Number of individuals sampled out of the animals present for each of the offerings and burial type.

	Entierro 2		Entierro 3	Entierro 5		Entierro 6		PPS OF2		Total # Sampled	Total% Sampled
	Primary	Secondary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary		
Eagles	9/9	0/0	0/0	1/1	0/0	8/9	7/9	1/1	0/0	26/29	90%
Canids	1/1	0/0	8/17	1/1	1/1	1/1	6/9	0/0	1/1	19/31	61%
Felids	2/2	2/4	5/7	1/1	7/15	4/5	7/10	0/0	1/1	29/45	64%
Leporidae	4/8	0/0	0/0	0/0	0/0	4/5	0/0	1/2	0/0	9/15	60%
Total	***16/20***	***2/4***	***13/24***	***3/3***	***8/16***	***17/20***	***20/28***	***2/3***	***2/2***	***83/120***	***69%***

Table 7.2 Number of isotope samples taken of bone and teeth for each species. Some individuals include multiple tooth and bone samples.

	Felid	Canid	Eagle	Leporidae	**Grand total**
Ent 3					
Bone	5	9	0	0	**14**
Tooth	6	8	0	0	**14**
Total	*11*	*17*	*0*	*0*	***28***
Ent 5					
Bone	6	2	1	0	**9**
Tooth	8	3	0	0	**11**
Total	*14*	*5*	*1*	*0*	***20***
Ent 2					
Bone	6	1	9	5	**21**
Tooth	4	2	0	0	**6**
Total	*10*	*3*	*9*	*5*	***27***
Ent 6					
Bone	12	8	15	4	**39**
Tooth	13	8	0	1	**22**
Total	*25*	*16*	*15*	*5*	***61***
Ofrenda 2					
Bone	1	1	1	1	**4**
Tooth	1	1	0	0	**2**
Total	*2*	*2*	*1*	*1*	***6***
Total	***62***	***43***	***26***	***11***	***142***

preserved specimen from Entierro 6. A variety of hindlimb long bone fragments were selected favoring those that were already fragmented to avoid having to break complete bones.

Nineteen out of 31 canids (61%) were selected, the majority comprised of secondary deposits from Entierros 3 and 6. All primary burials (n=3) were chosen, including teeth (usually mandibular M1 or M2, sometimes an incisor) and bone (cranial/mandibular fragment and long bone if available). Unfortunately, canid deposits were gravely affected by the taphonomic processes and most of the time only small fragmentary elements were available. As discussed below (see diagenesis section), this resulted in a patchy sample.

Ninety percent of the eagle population, represented by 26 bones from different individuals across the eagles found in Entierros 2, 6, 5 and Ofrenda 2, were sampled in the present study. Besides Entierro 6 where it was impossible to sample all eighteen eagles found in this context, a complete sample of eagles were taken from all other offerings. From each eagle, when available, the first proximal phalange of the hindlimb was chosen for analysis because it contained thick cortical bone, is usually well preserved, and its absence is not as visually noticeable.

The last group of animals sampled for the present study were leporids (rabbits and hares) found in the stomach contents of other animals. Nine out of the 15 individuals were sampled, comprising 60% of the leporids present in the assemblage. As many were young cottontails with differing degrees of gastric etching and other surface modifications (burning), I attempted to sample only individuals that looked well preserved and had no evidence of burning.

Methodology

The isotopic study presented in this chapter was carried out in collaboration with Andrew Somerville at the Paleodiet Laboratory in the Anthropology Department at University of California, San Diego (UCSD) under the direction of Dr. Margaret Schoeninger. These samples were processed and analyzed as part of the National Science Foundation Doctorate Dissertation Grant (BCS-1028851) during residency at UCSD as William R. Tyler Fellow, Dumbarton Oaks Research Library and Collection from 2012-2013. These samples were analyzed at the Scripps Institute of Ocenography (SIO) Analytical Facility utilizing a Thermo MAT 253 mass spectrometer. Below I summarize the sample processing and analytical procedures applied.

Cleaning

Many of the samples analyzed in this collection had undergone consolidation and restoration procedures that differed by offering contexts as discussed in Chapter 4. Due to application of different consolidants (Reconos^{110}, Reconos^{220}, Paraloid B-72, conventional glue) and glues (conventional glue and Paraloid B-72), initial surface cleaning and washes were a very crucial step in the processing of carbonate and collagen samples. The surface of each bone was always cleaned with a diamond point dremel bit or stainless steel engraving bit to remove all the surface contamination of both exterior and interior surfaces.

All spongy bone was removed at this point, as they are both easily contaminated by the consolidants and preservation of cortical bone is more secure.

Once the surface layer was scrapped, these samples were washed in ultrasonic baths in double distilled H_2O twice (five minutes each) and once in acetone. The consolidants visible on the surface began to dissolve with each wash. By the end of these washes, most of the consolidants were no longer visible. If there was still visible signs of consolidants remaining on the surface an extra wash in either double distilled water or acetone was added.

Among teeth samples ultrasonic washes were conducted first to clean any dirt and consolidants from the surface. Once the teeth dried overnight in the laboratory oven, the enamel surface was cleaned with the diamond point dremel bit. The procedure for teeth was reversed in this manner because the enamel of bone, not the dentine, was sampled but the dentine needed to be preserved for future studies. Thus once the surface was cleaned, a fragment of the tooth was chipped to separate the thin enamel of a carnivore from its dentine, cleaning the exterior surface with the dremel. Powdered dentine generated during drilling the interior was kept in plastic vials for future studies while the enamel was separated for carbonate processing.

Experimental work has demonstrated that B-72 consolidation procedures can be completely reversed with acetone, arguing basic cleaning methods were sufficient to rid the samples from altering the isotopic results (Bouwman 2008). Less is known about the two Mexican consolidants. While the conservator who developed Reconos^{110} and Reconos^{220} claimed that these conservation techniques should not affect the isotopic output (Valadez, et al. 2008), a small experimental project was conducted to secure consistent results between bones applied with other consolidants utilized in this collection. In this experiment two archaeological bone (jackrabbit femurs) were selected and cut into five pieces; each with differing consolidation procedures (one control, one with Reconos^{110}, two with Reconos^{110} and Reconos^{220} including one cortical and one spongy bone, and another with conventional Mexican glue Resistol 850). After application these bones were treated with the same cleaning methods described above and showed minimal error between the isotopic ratios of the samples, it was confirmed that the different consolidants should not affect the isotopic results.

Apatite

As explained above, two portions of the bone were analyzed: apatite (carbonate) and collagen. Carbonate sample preparation followed similar procedures to those described by Kotch et al. (1997). Once samples were cleaned, a small portion of the bone or tooth was chipped to be processed for bone carbonate. This fragment was ground into a fine powder using an agate mortar and pestle, and 35mg of this powder is put into micro-centrifuge tubes. These samples were then soaked in a 2% solution of sodium hypochlorite (bleach) (NaClO) for 24 hours to dissolve all organics, water rinsed and dried for 24 hours at 50°C. The bone powder was then soaked in 0.1M acetic acid (NaOH) for 24 hours, water rinsed and dried for 24 hours as a means for treating for diagenesis (Wright and Schwarcz 1996).

Once apatite samples were processed, 2 mg of this fine powder was weighed and transferred to glass tubes to be placed in the Thermofinnigan Delta XP Plus mass spectrometer interfaced with a gas bench at the SIO stable isotope analytical facility. An internal $CaCO_3$ standard was included to conduct corrections that was run over the course of six months with a reproducibility of ±0.2 SD for both $\delta^{13}C$ and $\delta^{18}O$.

Collagen

Collagen preparation procedures similar to Schoeninger et al. (1989) were followed. After cleaning, bones were demineralized utilizing 0.25M hydrochloric acid (HCl) over a course of a couple weeks at room temperature. The hydrochloric acid was changed every two days until the bones completely demineralized, turning into a transparent and soft collagen block. Once the bone had demineralized, humic acids were removed by soaking in 0.125M sodium hydroxide (NaOH). After this point the collagen was solubilized utilizing pH3 HCl in Teflon beakers, frozen, and freeze dried. Collagen yields were determined based on the differences between the original weight of the bone before demineralization and the end weight of the collagen post freeze-drying.

Analyses of collagen were performed on a Thermofinnigan Delta XP Plus, Conflow and Costech EA Mass Spectrometer at the SIO stable isotope analytical facility through a double continuous-flow (CF) IRMS combustion. Peedee belemnite (PDB) marine limestone standard for carbon and atmospheric N_2 (AIR) standard for nitrogen were utilized for data correction. Weight based C/N ratios for the collagen samples were determined utilizing LECO elemental analyzers for carbon and nitrogen, these results have a precision of ±1%.

Diagenesis

Inorganic and organic components of the bone react differently to the physical and biological processes of the burial environment and must be assessed utilizing separate methodologies (Schoeninger, et al. 1989). Degree of diagenesis among apatite data is assessed via two values calculated from the Fourier-transform infrared spectrometry (FTIR), C/P ratios and Infrared Splitting Factor (IR-SF) numbers (Nielsen-Marsh, et al. 2007; Smith, et al. 2007; Weiner and Bar-Yosef 1990; Wright and Schwarcz 1996). IR-SF was defined as $[565_{ht}+605_{ht}]/590_{ht}$, where X_{ht} is height at X wavenumbers (Garvie-Lok, et al. 2004:768). The carbonate content measured by the C/P ratio was calculated as $1415_{ht}/1035_{ht}$, a ratio shown to have a good linear relationship with overall carbonate content as measured by other means (Garvie-Lok, et al. 2004:768). This method offers the advantage of being able to examine CO_3 content and degree of fluorine substitution in addition to the crystallinity that is less expensive than utilizing XRD. To be able to confidently rely on apatite isotope ratios, mineral integrity must be scrutinized for each bone sample. In cases where mineral diagenesis is apparent, such samples must not be used for dietary reconstruction as argued by Wright and Schwarcz (1996).

Analysis of archaeological and modern bone collections have defined IR-SF splitting factors of most archaeological bone to range between 2.8-3.9, while values above 4.0 signify extremely degraded or burnt bone, and values reaching 7.0 indicate highly fossilized bone (Smith, et al. 2007; Weiner and Bar-Yosef 1990)[1]. The mineral carbonate phosphate value (C/P ratio) in modern bone averages around 0.5

[1] These values were based on FTIR-KBr methods while the present study utilized FTIR-ATR approach. A recent study demonstrated FTIR-ATR methods tend to average 0.5 higher in IR-SF splitting factor while there is not much

Table 7.3 Carbonate and collagen samples used and dropped based on diagenesis results.

	Carbonate				Collagen		
	Bone-Used	*Bone-Dropped*	*Teeth*	*Total*	*Used*	*Dropped*	*Total*
Ent.2	13	8	6	*27*	14	6	*20*
Ent.3	2	12	14	*28*	1	10	*11*
Ent.5	0	9	11	*20*	0	4	*4*
Ent.6	31	8	22	*61*	32	4	*36*
OF2	4	0	2	*6*	4	0	*4*
Total	**50**	**37**	**55**	***142***	**51**	**24**	***75***

while values as low as 0.1 signify that it has turned into extensively degraded minerals (Smith, et al. 2007; Wright and Schwarcz 1996). By the time C/P ratios reaches 0.1 the baseline level and the splitting factor no longer seem controlled by the loss of carbonate, paralleling the processes that are indicated by low IR-SF values (Smith, et al. 2007).

Based on this standard for assessing diagenesis, all bone carbonate samples were analyzed with the Fourier-Tranfor Infrared spectrometer with attenuated total reflectance (ATR) attachment at the UCSD Department of Chemistry and Biochemistry Laboratory to calculate IR-SF and C/P ratios. Similar to Garvie-Lok, et al. (2007:768), spectra were collected from 4000 to 400 cm^{-1} that were scanned 100 times with a resolution of 8 cm^{-1}. Samples with IR-SF values above 4 and C/P values below 0.1 (not rounding up) were excluded from the present study. None of the IR-SF values were higher than four, but many of the C/P ratios were very low, and 37 out of 87 bone apatite data were dropped (Table 7.3). There was a correlation between C/P ratios and IR-SF values of R^2=0.53 (Figure 7.2), indicating that these two values correlated to levels of diagenesis in bone apatite as demonstrated by Smith (2007). Incredibly low C/P ratios, starting at 0.03 were recorded although many were above the cutoff number ranging as high as 0.46. The majority of these dropped values were from Entierros 3 (n=12) and 5 (n=9), leaving only two bone samples from Entierro 3 and none from Entierro 5. As expected, these two contexts were by far in the worst state of preservation and the diagenesis markers confirm their deteriorated state.

difference in C/P ratio. Since none of the values in the present study were above 4, this distinction does not affect the sample.

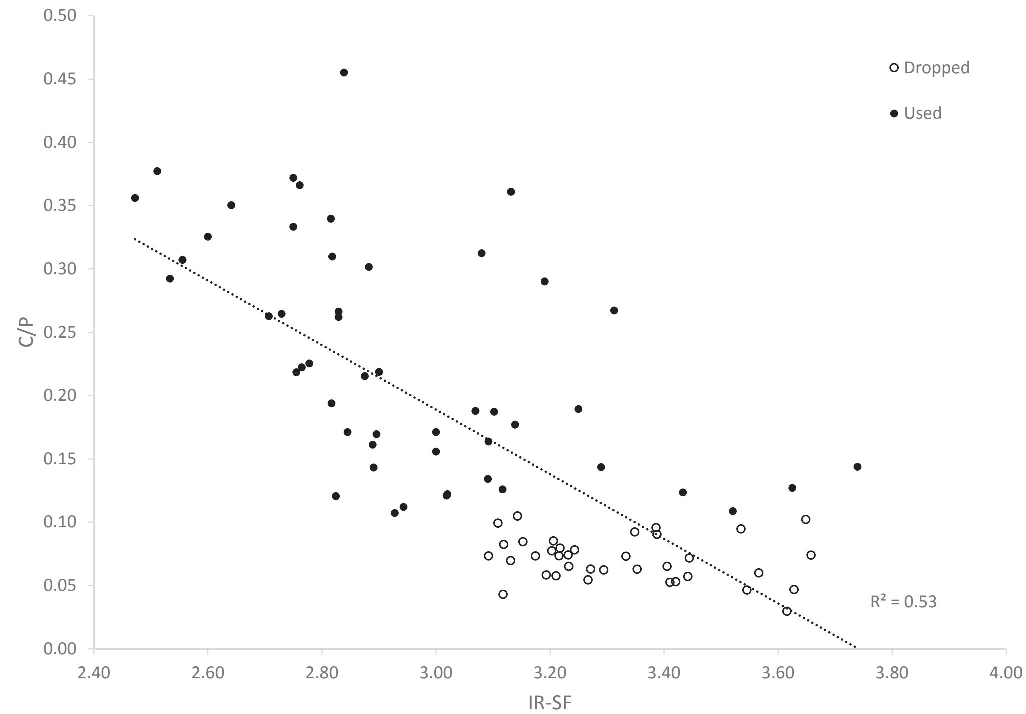


Figure 7.2 Correlation of two diagenetic markers for apatiate, C/P and IR-SF, of used and dropped samples.

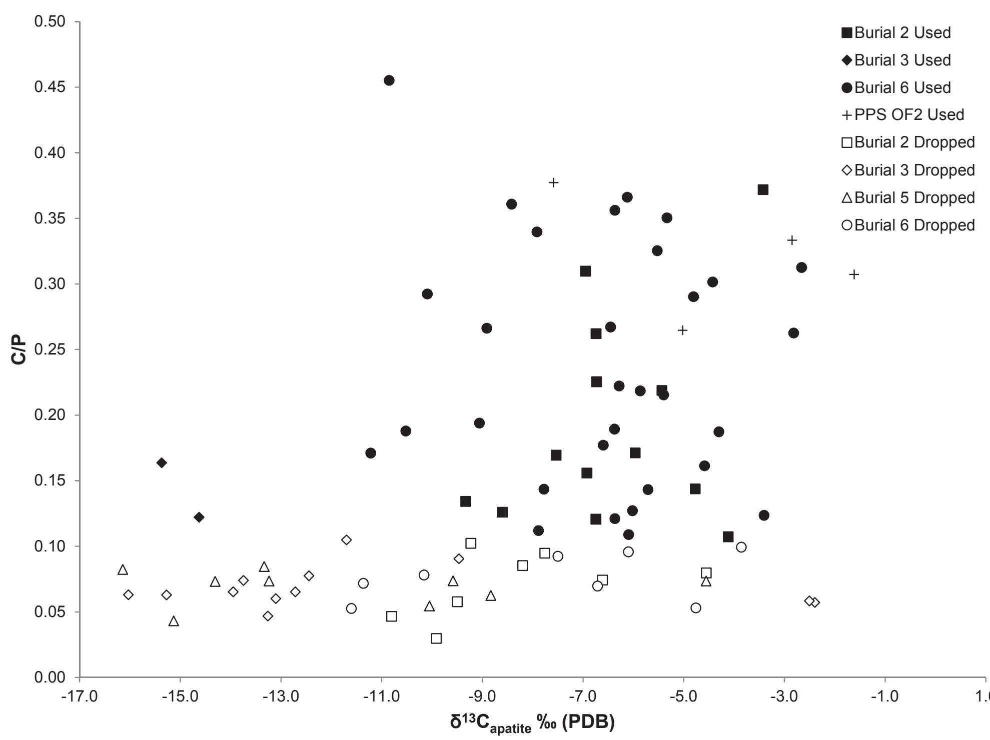


Figure 7.3 Distribution of C/P and $\delta^{13}C_{apatite}$ values that were used (black) and dropped (white).

A scatter plot of the C/P ratios and the $\delta^{13}C_{apatite}$ values demonstrate that the values with the most negative $\delta^{13}C_{apatite}$ values tend to be samples with C/P ratios under 0.1 which were dropped from the present study (Figure 7.3). Luckily, enamel is not subject to the same demineralization and diagenesis processes as bone, especially at a site that certainly did not undergo fossilization. Thus all teeth samples can be utilized in the present study, in some cases providing the only reliable data when all bone samples were dropped due to results of the diagenesis test.

As organic components of bones are highly susceptible to the taphonomical processes of the burial environment, it was important to assess the integrity of the collagen analyzed for archaeological bone (Ambrose 1990; DeNiro and Weiner 1988; Schoeninger, et al. 1989). Two lines of evidence evaluated the degree of bone collagen preservation: % collagen yield and C/N ratios. As bone is comprised of about 40% collagen, archaeological samples often preserve about 22% of this yield. In the present study, a cut off for the minimum collagen yield of one percent was set following current literature (Ambrose 1990; Schwarcz and Schoeninger 2011). C/N ratios, calculated as (%C/12)/(%N/14), provide us with another avenue to compare the collagen preservation in relation to modern bone. As C/N ratios of modern bones range between 2.9 and 3.6 (Ambrose 1990; DeNiro and Weiner 1988; Schoeninger, et al. 1989), archaeological samples with C/N ratios that fell outside this range were excluded from the study.

Collagen yield and C/N ratios were calculated for the bones from Teotihuacan. Based on the criteria stated above, 24 collagen samples out of 75 total bones were dropped (Table 7.3). For the most part those with low collagen yield overlapped with abnormal C/N ratios, and the latter criteria excluded more number of specimens than the former. The C/N ratios ranged from 3.19 to 27.56. Samples that were not dropped tended to be within normal $\delta^{13}C_{collagen}$ values (between -6.14 and -19.5) while dropped samples had values as low as -28.3‰ (Figure 7.4). Similar carbonate samples, Entierros 3 and 5 suffered extensive diagenesis which resulted in the absence of collagen samples from Entierro 5 and only one sample from Entierro 3.

Strict criteria to assess degree of diagenesis of collagen and apatite samples were necessary as many of the samples dropped proved to be values with extreme carbon isotopic values, suggesting that

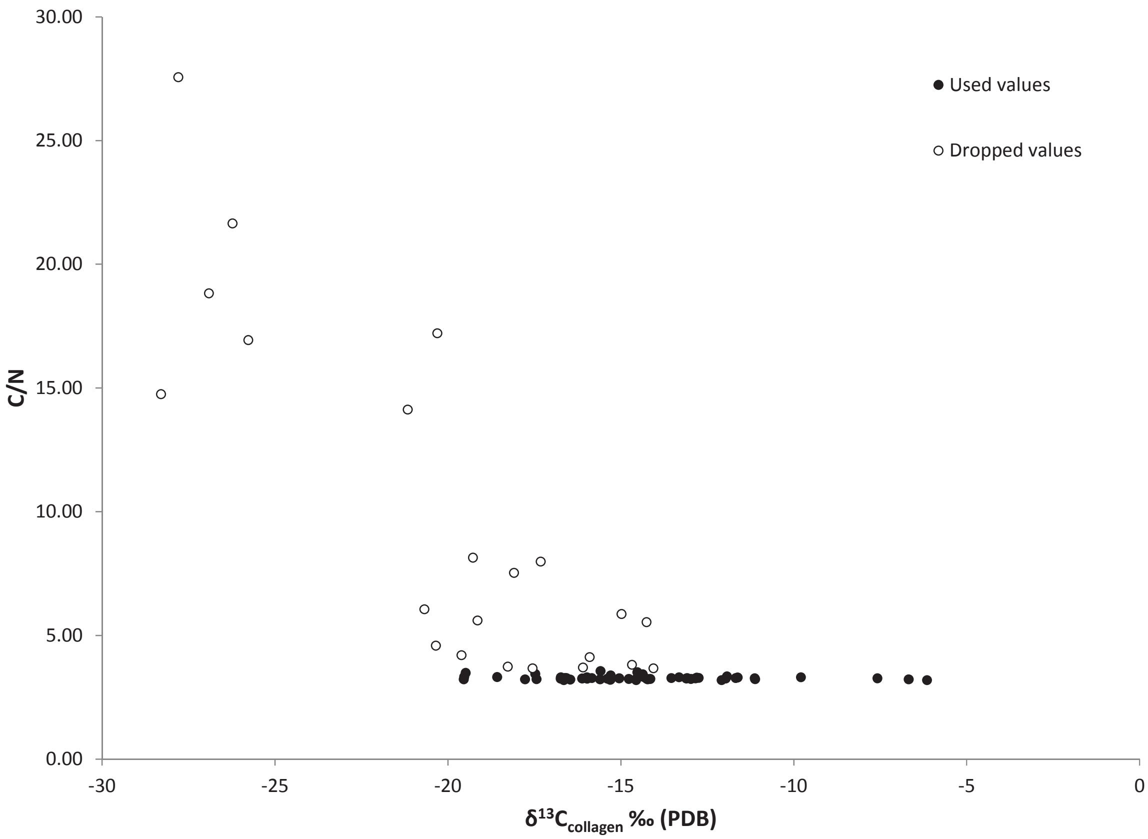


Figure 7.4 Distribution of C/N and $\delta^{13}C_{collagen}$ values that were used (black) and dropped (white).

retaining these samples would have significantly altered data interpretation. While many of the samples dropped from Entierros 3 and 5 corresponded to samples with visual cues of bad preservation, several samples that looked fairly well preserved, for example from Entierros 2 and 6, resulted in values suggesting digenetic processes were affecting the bones. Solely visual inspection of the bone is not enough, and in this case a full analysis of diagenesis was necessary.

Once samples that underwent diagenesis were removed, several adjustments were made in the dataset. As many of the animals had more than one sample selected (usually of teeth and bone) for each individual, one sample for each individual was selected to look at overall patterns. Because bone provides both collagen and apatite data and more readily represents the diet of the animal towards the end of its life, bone was favored over tooth in the selection process. As Wariner and Tuross (2009) have illustrated, enamel apatite tends to be enriched over bone by 2.3‰ in carbon and 1.7‰ in oxygen values, teeth were

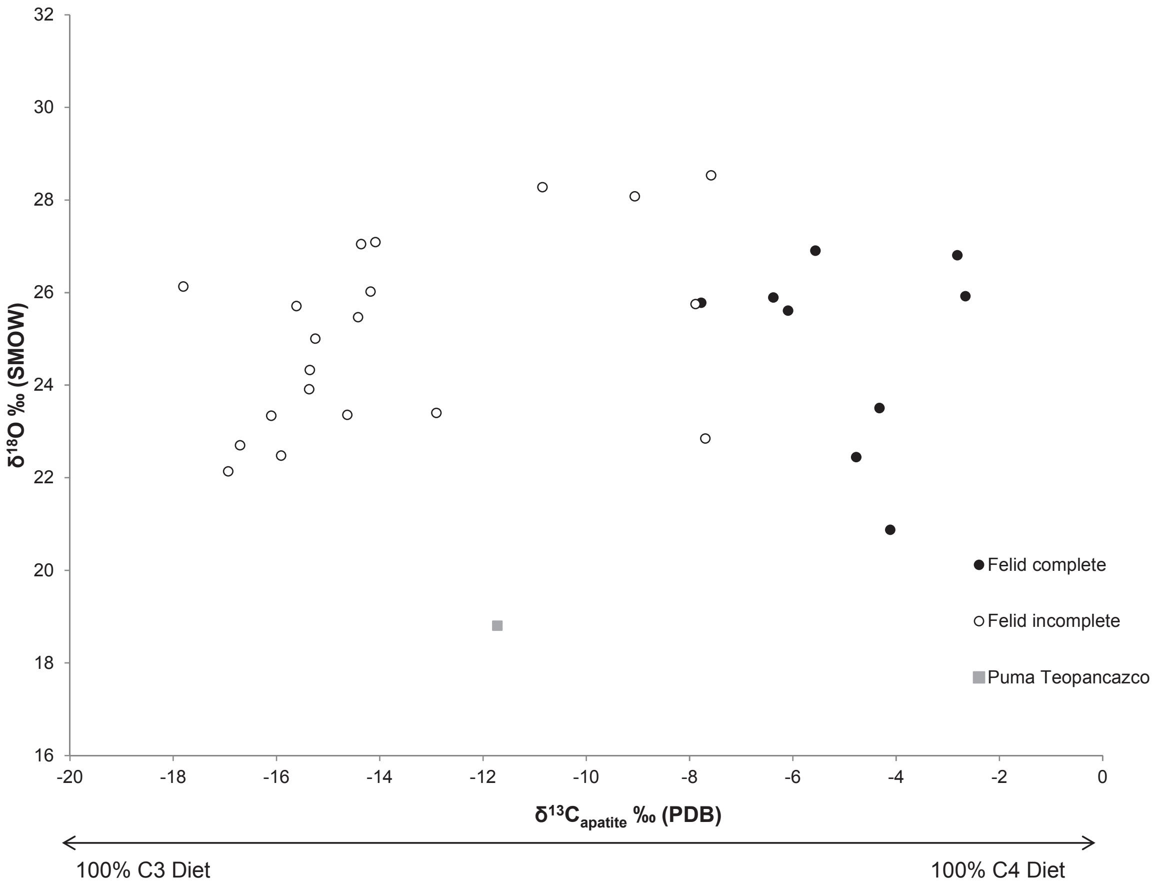


Figure 7.5 Distribution of felid bone apatite data of the $\delta^{18}O$ and $\delta^{13}C_{apatite}$ values for complete (black), incomplete (white) and a puma tooth from Teopancazco (grey square) (Morales Puente, et al. 2012:Table XI.6).

corrected to match bone samples. It is at this point that intra-species variation and overall patterns in isotopic composition was examined.

Felids

Felid apatite values had a bimodal distribution extending from -17.8 to -2.7‰. This variation can be attributed to the differences between complete versus incomplete felids (Figure 7.5). The $\delta^{13}C_{ap}$ values of complete felids were significantly more enriched ($p<0.001$)[2] in ^{13}C, averaging -6.2‰ ± 1.7 (1σ), while incomplete animals had a mean of -13.6‰ ± 3.2 (1σ) (Table 7.4). Some incomplete animals had fairly enriched $\delta^{13}C_{ap}$ values that suggest that alongside incomplete felids that were based on a dominantly or

[2] All statistical significance was evaluated utilizing the student t-test assuming a type two, two-tailed normal distribution.

Table 7.4 Summary of felid collagen and apatite results.

	13Cap	18Oap	13Ccol	15Ncol
Felid Complete (9 apatite, 9 collagen)				
Average	-6.2	25.0	-12.0	8.6
Stand	1.7	2.1	3.9	1.8
Range	-7.8 to -2.7	22.4 to 26.9	-15.3 to -6.1	7.1 to 11.8
Felid Incomplete (20 apatite, 6 collagen)				
Average	-13.6	25.1	-16.4	7.5
Stand	3.2	2.0	2.6	1.1
Range	-17.8 to -7.6	22.1 to 28.5	-19.5 to -11.9	6.0 to 8.7
Comparative other Felids in C3 ecosystems (n=4) [1]				
Puma (C3 environment)[2]			-16.1	7.6
Average			-17.0	8.0
Stand			2.8	1.6
Range			-20.9 to -14.3	6.2 to 10
Comparative other Felids in C4 ecosystems (n=3) [1]				
Average			-7.0	10.0
Stand			3.7	0.2
Range			-1.2 to -4.2	9.8 to 10.2

Notes: Data summariezed from 1. Table A2, Kelley 2000, and 2. Schoeninger and Deniro 1984.

even exclusively C_3 based diet, some incorporated varying degrees of C_4 based resources into their diet. On the other hand, all complete felids had values that evidently incorporated C_4 based resources to varying degrees.

The percentage of C_4 dietary input (PC_4) was calculated based on the formula (Schwarcz 1991; White and Schwarcz 1989:456):

$$PC_4=(\delta_3-(\delta_b-\Delta)/(\delta_4-\delta_3)*100$$

where δ_3 represented the expected isotopic $\delta^{13}C_{ap}$ value for C_3 plants (-25‰), δ_b equaled the observed $\delta^{13}C_{ap}$ value, Δ was the diet-apatite spacing (9.7‰) , and δ_4 was the expected $\delta^{13}C_{ap}$ value for maize (-9‰). Applying this model to the felid $\delta^{13}C_{ap}$ distribution, the PC_4 ranged from a 100% C_3 based diet to as high as a 79% C_4 based diet.

There was no statistical differences among $\delta^{18}O$ results of complete and incomplete felids ($p<0.8$) and a closer look at this variability will have to be conducted in the future. As a comparison, the carbon and oxygen isotopic ratios reported of an archaeological puma tooth from the site of Teopancazco,

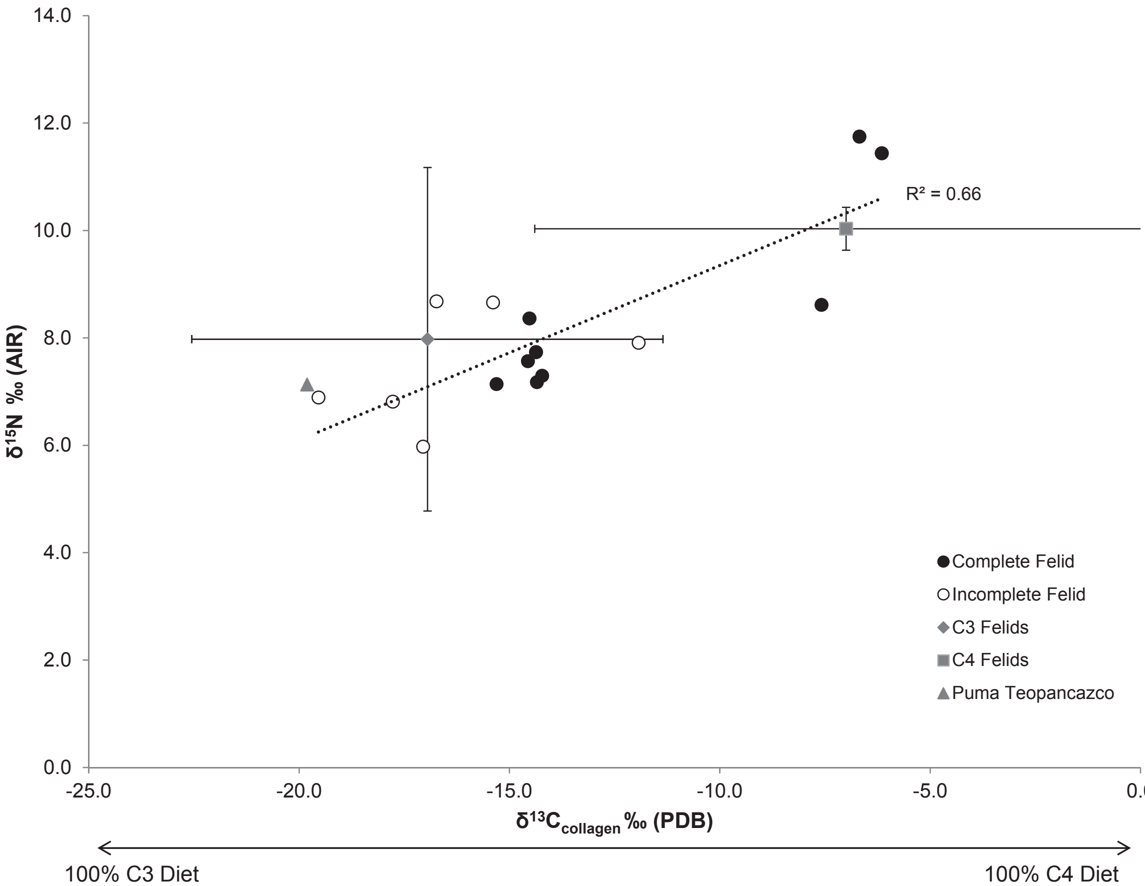


Figure 7.6 Distribution of felid bone collagen data of the $\delta^{15}N$ and $\delta^{13}C_{collagen}$ values of complete (black) and incomplete (white) samples from the offerings, a puma from Teopancazco (triangle) (Morales Puente, et al. 2012:Table XI.6), and modern comparative samples of felids in C_3 (diamond) and C_4 (square) based habitats (Kelley 2000:Table A2).

Teotihuacan was plotted (Morales Puente, et al. 2012). The Teopancazco puma $\delta^{13}C_{ap}$ value (-11.72‰)[3] more closely resembled results obtained from secondary burials, accentuating that the primary burials from the dedicatory caches were significantly different from other, more wild, felid population. Interestingly, the $\delta^{18}O$ value of the Teopancazco puma was the lowest value (18.8‰) recorded among the felid population. It would require examining in more detail the oxygen isotope variation with more data about the surrounding water sources in the future.

The collagen samples (like the carbonates) exhibited a pattern between complete and incomplete felids (Figure 7.6) where primary burials tended to have enriched $\delta^{13}C_{col}$ values averaging -12‰ ± 3.9

[3] The tooth sample originally reported as -9.4 was corrected based on Warinner and Tuross (2009) that report that enamel $\delta^{13}C_{ap}$ values are enriched by 2.3‰ and $\delta^{18}O$ values by 1.7‰.

(1σ) while secondary burials had a mean of -16.4‰ ± 2.6 (1σ) (Table 7.4). This distribution was significantly distinct ($p<0.05$), although there was an obvious cluster of primary burials with $\delta^{13}C_{col}$ values that overlap in range with those of secondary burials.

The distribution of the collagen isotopic ratios from Teotihuacan were compared to wild pumas and other felids reported in the literature. Kelley (2000:Table A2) compiled a list of published $\delta^{13}C_{col}$ and $\delta^{15}N_{col}$ values of avian and mammalian species which included a puma from Southern California with $\delta^{13}C_{col}$ value of -17.6‰ (or –16.1‰ after adjustment due to industrial effect, all other modern values are reported post-correction)[4] and $\delta^{15}N_{col}$ of 7.6‰ (Schoeninger and DeNiro 1984:Table 1). This value is within expected range compared to other felids inhabiting mainly C_3 based ecosystems reported from other studies like the bobcat (-14.3‰ $\delta^{13}C_{col,}$ 10.0‰ $\delta^{15}N_{col}$), the lynx (-20.9‰ $\delta^{13}C_{col,}$ 6.2‰ $\delta^{15}N_{col}$) and the tiger (-16.5‰ $\delta^{13}C_{col,}$ 8.1‰ $\delta^{15}N_{col}$) (Kelly 2000:Table A2) that contained $\delta^{13}C_{collagen}$ values (including the modern puma) ranging from -22.4 to -15.8‰ with a mean of -18.5‰ while their $\delta^{15}N$ values were between 6.2 and 10.2‰ with an average of -8‰ (Kelly 2000:Table A2) (Table 7.4). In comparison, felids from C_4 based vegetation zones like the leopard (-5.6‰ $\delta^{13}C_{col,}$ 10.2‰ $\delta^{15}N_{col}$), the lion (-4.2‰ $\delta^{13}C_{col}$, 9.8‰ $\delta^{15}N_{col}$), and the cheetah (-11.2‰ $\delta^{13}C_{col}$, 10.1‰ $\delta^{15}N_{col}$) (Kelly 2000:Table A2) exhibited $\delta^{13}C_{collagen}$ values ranging from -12.7 to -5.7‰ and $\delta^{15}N$ values of 9.8 to 10.2‰ (Kelly 2000:Table A2) (Table 7.4). The Teotihuacan felids, which included pumas and jaguars, included $\delta^{13}C_{collagen}$ values ranging from -19.5 to -6.1‰ and $\delta^{15}N$ values ranging from 6 to 11.8‰. Incredibly this distribution covers the variation expressed by modern felids inhabiting both C_3 and C_4 based habitats.

Inputting the isotopic averages of felids with C_3 and C_4 based diets and their respective error bars (± 2σ), there is a clear patterning among the archaeological felid samples. Three complete felids were outliers, more closely distributed within the range of the felids living in more C_4 based habitats (Figure 7.6). In comparison, the secondary and other primary felids tended to be distributed within the range of C_3

[4] The Industrial Effect is caused by the differences in atmospheric CO2 in modern versus pre-industrial periods due to the burning of fossil fuels. Thus all modern samples compared to archaeological materials need to be adjusted positively by 1.5‰. All modern samples compared in this study have been adjusted accordingly in the tables and figures.

based habitat zones. Plotting a puma from Teopancazco reported by Morales Puente, et al. (2012:Table XI.6), their $\delta^{13}C_{collagen}$ value (-19.8‰) and $\delta^{18}O$ value (7.1‰) align more closely with the C_3 based habitat and the majority of the pumas.

The three felids that have unnaturally high C_4 based diets were Elementos 143, 1818 and 1984. As discussed in Chapter 5, these three individuals correspond to one of the pumas that was found caged in Entierro 2, a puma with pathologies on its femur, pelvis and cranium, and another complete puma with fused left upper limb respectively; all of these individuals were already suspected to be animals kept in captivity based on the zooarchaeological indicators. The isotopic data adds another line of evidence to support the hypothesis that some of the animals from these offerings were kept in captivity.

The significant variation observed on the $\delta^{15}N$ is harder to interpret. In general there seems to be two trophic levels distributed within the population and a gradation in degree of omnivory. However, this grouping does not correspond to a significant difference between the $\delta^{15}N$ values of primary and secondary deposits ($p<0.25$). Some of the $\delta^{15}N$ values are the highest ranges observed thus far (up to 11.4‰), while others range within very low levels for this specialized carnivore (6.9‰). At this point, all that can be said is that it is probably not a coincidence that the two individuals with zooarchaeological signature of pathologies happens to also be the individuals with the most enriched $\delta^{15}N$ values.

Canids

The patterning for canids was not as clear as the felids, probably due to the smaller sample size of complete individuals (n=3). The majority of the canid $\delta^{13}C_{apatite}$ data concentrated between -16 and -10‰ while two outliers ranged between -5 and -4.3‰ (Figure 7.7). The PC_4 of these two outliers range between 69% and 64%, suggesting very high levels of C_4 plant intake. Unlike felids, these two groupings do not necessary correspond to complete versus incomplete animals. In fact, the two outliers that seemed to have exceedingly high levels of C_4 dietary input were composed of one primary burial from Entierro 6, Elemento 2199, and a prepared wolf head found in Ofrenda 2, Elemento 209. The other two complete individuals, Elemento 213.1 from Entierro 2 and Elemento 1636.2 from Entierro 5 had $\delta^{13}C_{apatite}$ values that, like all the other canid data, suggest relatively high reliance on C_3 based diet. In fact, some of the

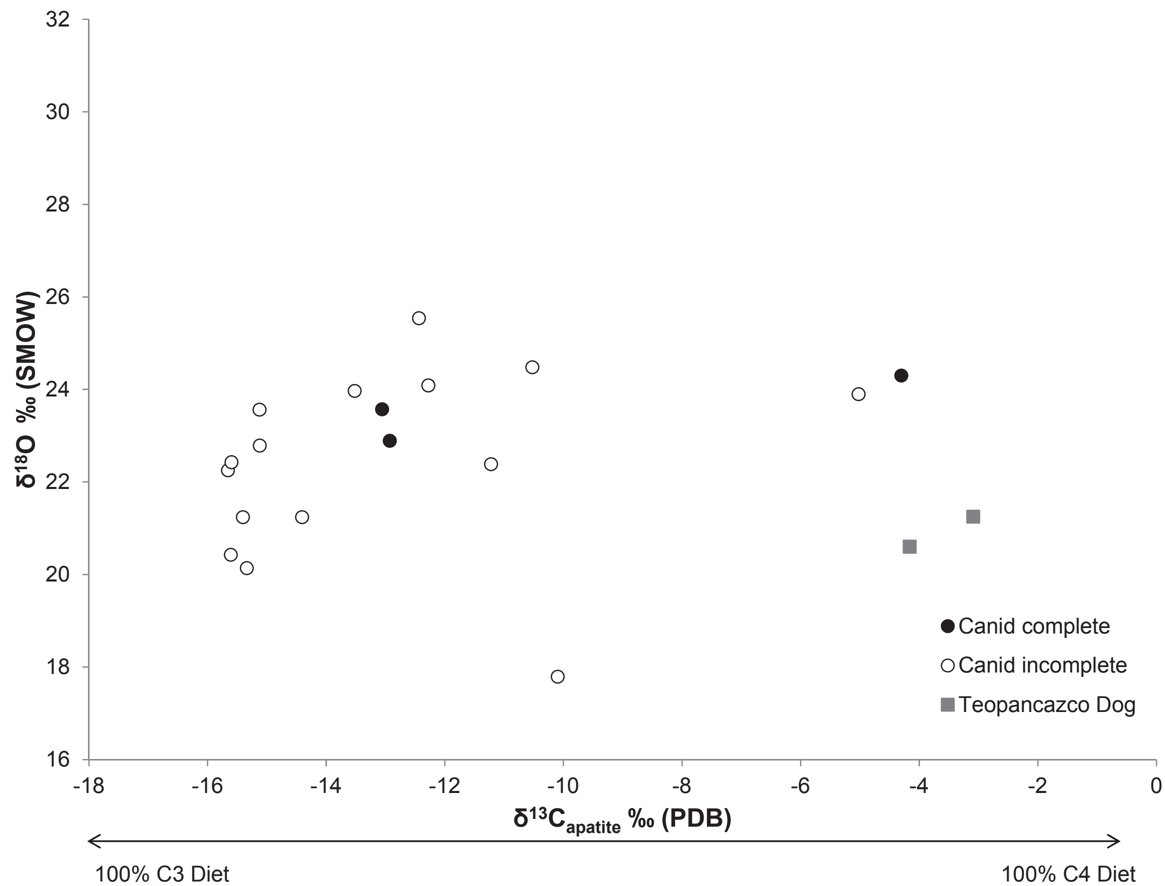


Figure 7.7 Distribution of canid bone apatite data of the $\delta^{18}O$ and $\delta^{13}C_{apatite}$ values for complete (black), incomplete (white) and a dog tooth from Teopancazco (grey square) (Morales Puente, et al. 2012:Table XI.6).

lowest values suggest 100% reliance on C_3 foods. Two archaeological samples of dogs from the Teopancazco apartment compound (Morales Puente, et al. 2012:Table XI.6) were plotted into this graph as a comparison. Dogs often reflect human diets as they scavenge human food; thus they have expectedly high C_4 (maize) input with $\delta^{13}C_{apatite}$ value of -3.1 and -4.2‰[5]. These values were fairly close to those observed among the two outliers mentioned above. This, again, demonstrates that at least two of the wolves from this sample were consuming exceedingly high C_4 based diet similar to dogs.

$\delta^{18}O$ ratios were fairly consistent, the majority ranging between 26 and 20‰ with the exception of one outlier whose $\delta^{18}O$ was 17.8‰. Even the two individuals with enriched $\delta^{13}C_{apatite}$ values had similar $\delta^{18}O$ ranges, suggesting a fairly homogenous local group.

[5] With tooth correction, see footnote 2.

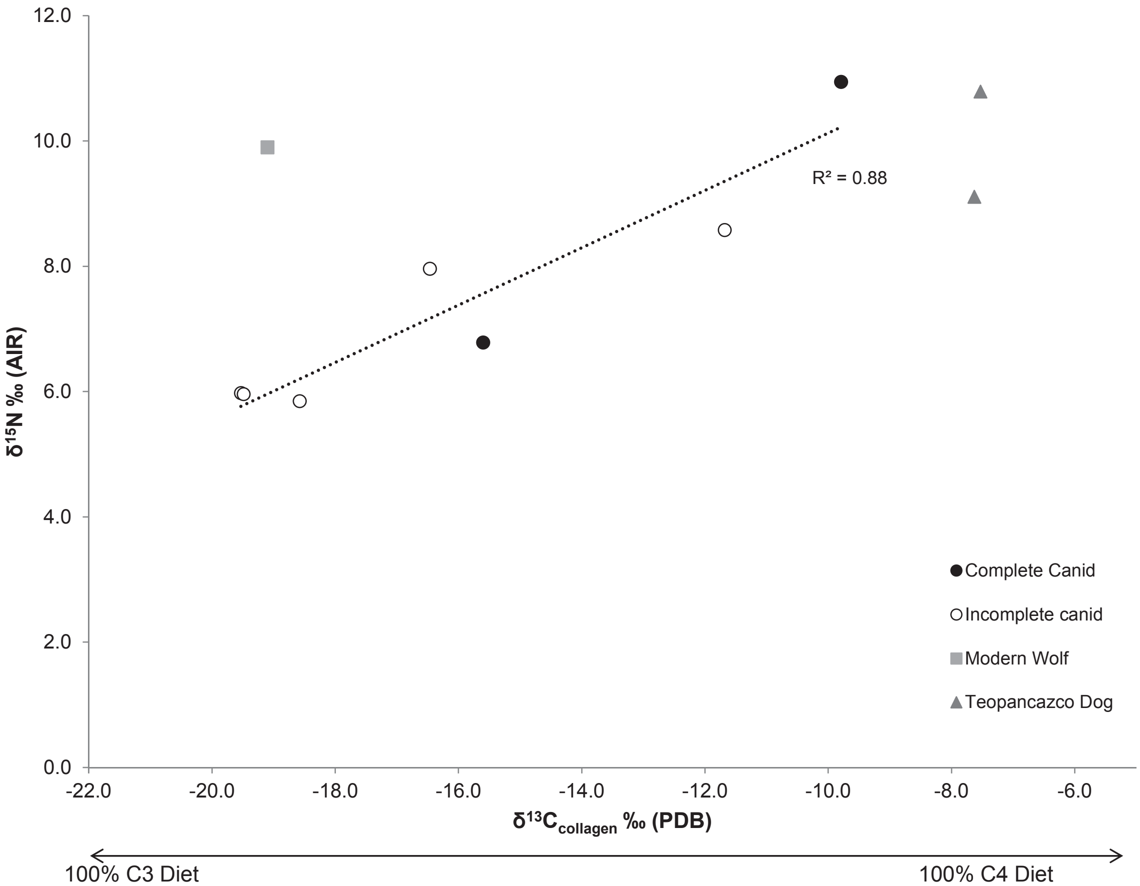


Figure 7.8 Distribution of canid bone collagen data of the $\delta^{15}N$ and $\delta^{13}C_{collagen}$ values of complete (black) and incomplete (white) samples from the offerings, a dog from Teopancazco (triangle) (Morales Puente, et al. 2012:Table XI.6), and a modern comparative sample of a wolf from a C_3 based habitat (square) (Kelley 2000:Table A2).

The $\delta^{13}C_{collagen}$ distribution among the canids ranged quite extensively, from -19.5 to -9.8‰ while there was an equally high variability in the $\delta^{15}N$ distribution ranging from 6 to 10.9‰ (Figure 7.8). There was no pattern between primary and secondary burials. As indicated during the discussion of the diagenesis tests, the collagen samples in particular were skewed to materials from Entierro 6 (n=5) with only one individual from Entierro 2 and Ofrenda 2. This means none of the collagen samples from Entierros 3 and 5 had sufficient preservation to be included in the study. Compared to a wild wolf mandible from Alaska that would have been in a dominantly C_3 based environment, with a $\delta^{13}C_{collagen}$ value of -19.1‰[6] and a $\delta^{15}N$ ratio of 9.9‰, the canid remains from Teotihuacan are more enriched in

[6] Post correction of industrial effect, see footnote 3.

$\delta^{13}C_{collagen}$. There was a range of $\delta^{13}C_{collagen}$ values from the dedicatory caches; some that were consuming similar C_3 based diets while others demonstrated more heavy reliance on C_4 resources given the majority of the natural vegetation would have been C_3 based (Figure 7.8). The $\delta^{15}N$ value from Teotihuacan was similarly varied, ranging from a trophic level lower than the modern wolf, to even 1‰ more enriched in one case. This distribution indicated a range of omnivory and carnivory practiced in this sample.

Another comparison can be made among the dogs sampled from the Teopancazco apartment compound presenting very high $\delta^{13}C_{collagen}$ (-7.5 and -7.6‰) and $\delta^{15}N$ (10.8 and 9.1‰) values (Morales Puente, et al. 2012:Table XI.6). What is surprising is that some of the wolves from the dedicatory cache exhibit lower $\delta^{15}N$ values than the archaeological dogs from Teopancazco, particularly those with more negative $\delta^{13}C_{collagen}$ values tended to have much lower $\delta^{15}N$ ratios than the dogs. In fact, there was an apparent positive correlation between the $\delta^{13}C_{collagen}$ and $\delta^{15}N$ ratio (R^2=0.9); with increasing trophic level, and thus meat consumption, there was also an increasingly mixed C_4 based source into the diet. Part of this patterning can be explained by the trophic level effect, although more minimal variation than among $\delta^{15}N$ ratios, that would have enriched $\delta^{13}C_{collagen}$ ratios 1‰ with each trophic level. However, such a tight correlation with such a steep slope suggests that the protein source itself could have been C_4 based, also accentuating this pattern.

Eagles

The eagle's $\delta^{13}C_{apatite}$ contained the lowest standard deviation (1.5) concentrated around the mean of -6.2‰. This suggests a relatively homogeneous population of fairly enriched $\delta^{13}C_{apatite}$ values that ranged between -8.9 and -2.8‰ (Figure 7.9). The PC_4 of this assemblage, then, varied between 40 to 78% suggesting that all eagles, even those with most negative $\delta^{13}C_{apatite}$ values consumed nearly half C_4 based diets. Secondary deposits of eagles could not be distinguished from primary burials, probably because both sacrificed and prepared eagles were drawn from the same managed population that consumed C_4 based diets to differing degrees.

In contrast to the relatively homogenous $\delta^{13}C_{apatite}$ values, their $\delta^{18}O$ values were the most variable (2.7, 1σ) which may reflect their extended home ranges. Could this be a result of differences in water

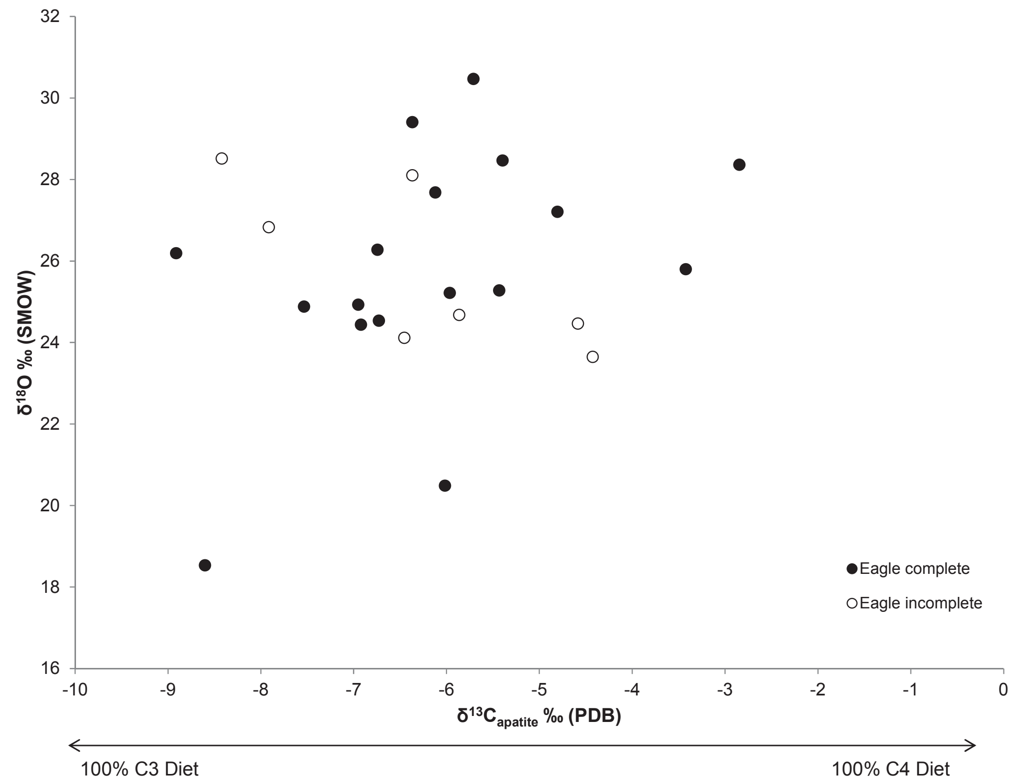


Figure 7.9 Distribution of eagle bone apatite data of the $\delta^{18}O$ and $\delta^{13}C_{apatite}$ values for complete (black) and incomplete (white) samples from offering contexts.

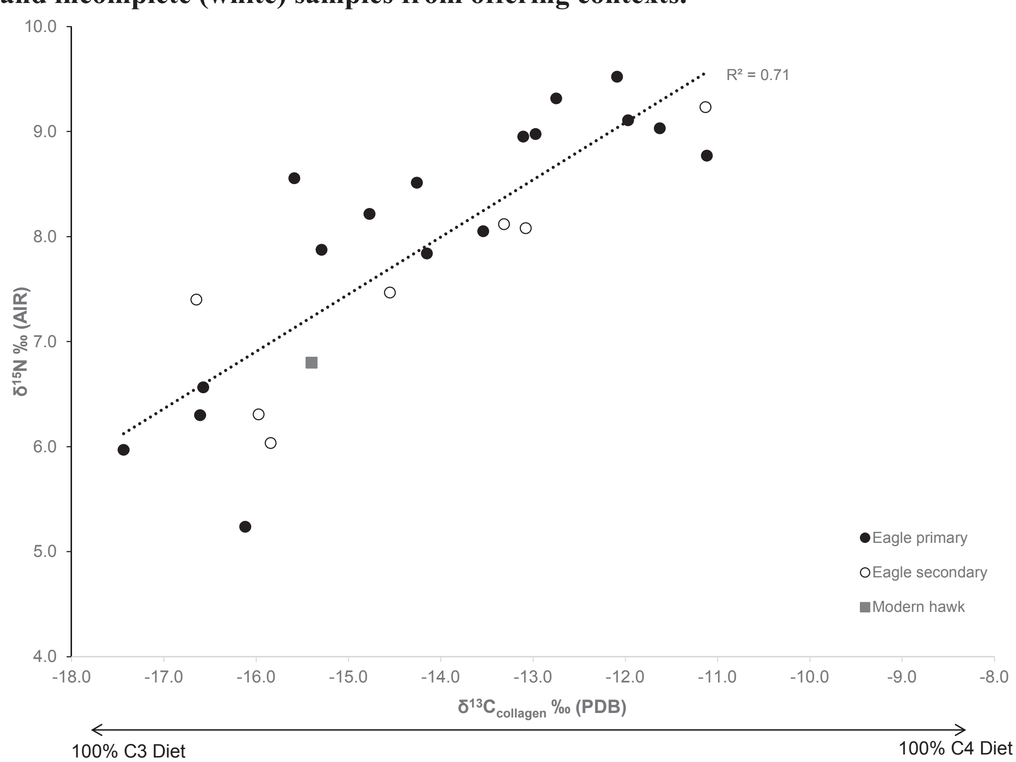


Figure 7.10 Distribution of eagle bone collagen $\delta^{15}N$ and $\delta^{13}C_{collagen}$ values of complete (black) and incomplete (white) samples from the offerings, and a modern comparative sample of a hawk from a C_3 based habitat (square) (Kelley 2000:Table A2).

sources between captive and wild eagles? Eagles have only been spotted to drink water directly in captive habitats (Watson 2010) that could have added to this variation. More data on the variation of local water sources in this area is necessary to interpret these results. The collagen results from eagles averaged -14.2 ± 1.9‰ (1 σ) for $\delta^{13}C_{collagen}$ and 7.9 ± 1.2 (1 σ) for $\delta^{15}N$ (Figure 7.10). Like the apatite dataset, both the $\delta^{13}C_{collagen}$ and $\delta^{15}N$ values had no significant differences between primary and secondary burials. Unfortunately there were no good comparative materials available for eagle populations that can help distinguish the Teotihuacan sample from a "wild" signature. Only a modern rough-legged hawk (*Buteo lagopus*) from Southern California that consumes C_3 based trophic chain has been cited in the literature with values of $\delta^{13}C_{collagen}$ of -15.4‰ and $\delta^{15}N$ of 6.8‰ (Schoeninger and DeNiro 1984). The hawk value, plotted in Figure 7.10, overlaps with some of the lower ranges in the $\delta^{13}C_{collagen}$ and $\delta^{15}N$ values, but the range exhibited by the eagles are much more variable and a more robust comparative sample would be necessary to explain this variation.

Like the canid samples, there was a positive correlation between the $\delta^{13}C_{collagen}$ and $\delta^{15}N$ distribution (R^2=0.7). Unlike the felids, the eagle population could not be distinguished isotopically between primary and secondary deposits. This is in accordance to the zooarchaeological dataset that also demonstrated that secondary deposits of eagles also contained pathological indicators of confinement despite obvious markers that the animal was deposited as a prepared eagle cadaver. Ethnographic and other archaeological correlates suggest this is probably because eaglets were captured from their nests while still fledging, being kept in captivity most of their lives (See Chapter 9). This most likely demonstrates that eagles, primary and secondary, were drawn from the same population of managed raptors kept within city confines with varying duration of their residency.

Leporidae

All of the leporid materials analyzed in this collection were from the stomach contents of sacrificed carnivores. Their apatite distribution overlapped most closely with the eagle population, the $\delta^{13}C_{apatite}$ value averaged -5.9‰ ± 2.1 (1σ) and their $\delta^{18}O$ ratio averaged 26.3‰ ± 1.8 (1σ) (Figure 7.11). The $\delta^{13}C_{apatite}$ distribution ranged from -9.3‰ to -1.6‰ correspond to PC_4 values ranged

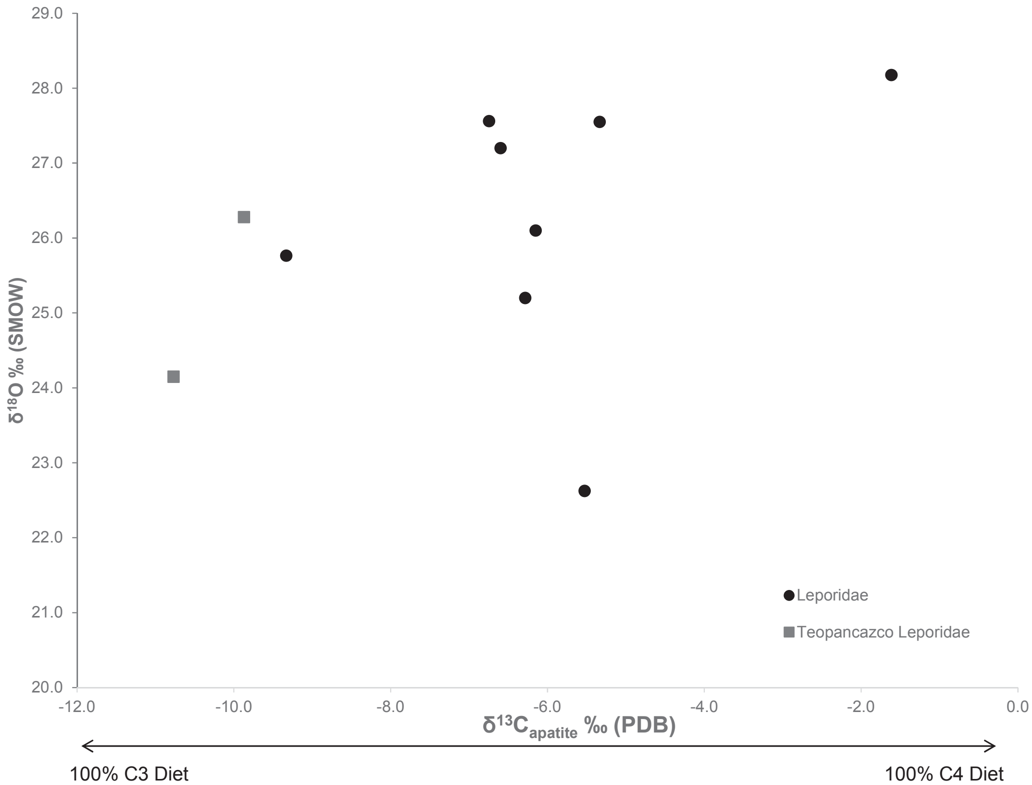


Figure 7.11 Leporidae bone apatite $\delta^{18}O$ and $\delta^{13}C_{apatite}$ values from offerings (circle) and the Teopancazco apartment compound (square) (Morales Puente, et al. 2012:Table XI.6).

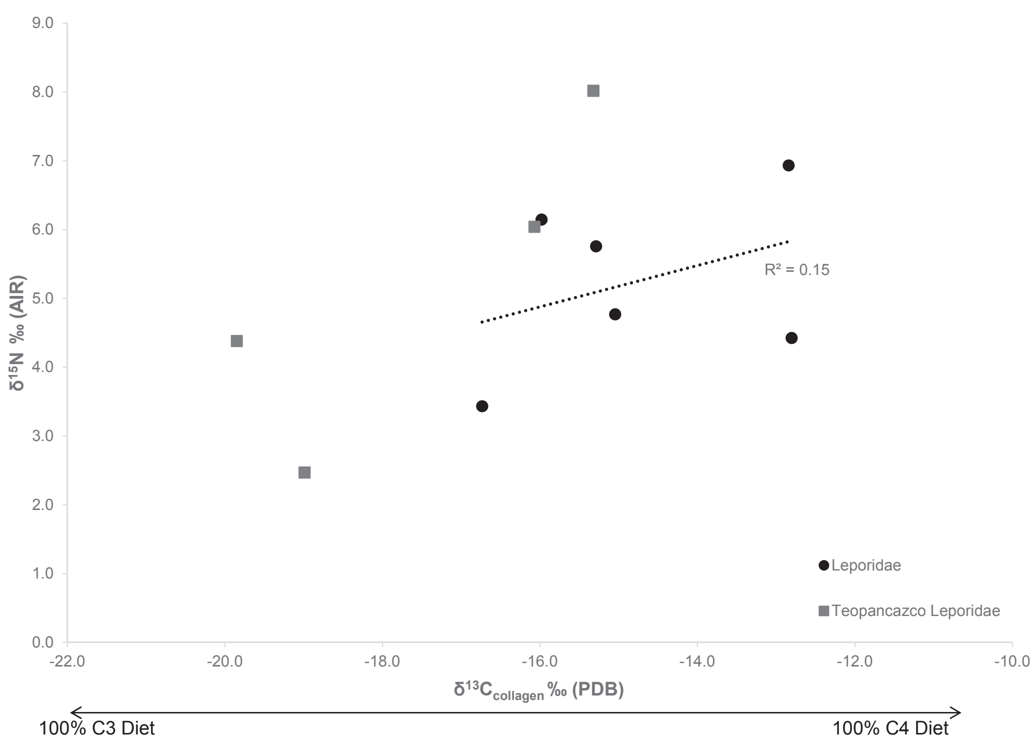


Figure 7.12 Leporid bone collagen $\delta^{15}N$ and $\delta^{13}C_{collagen}$ values from offerings (circle) and the Teopancazco apartment compound (Morales Puente, et al. 2012:Table XI.6).

from 38% to as high as 86%; the highest C_4 based diet recorded thus far. This enriched value corresponded to a rabbit from Ofrenda 2 (Elemento 211.2).

Comparing this assemblage to two leporid teeth from the Teopancazco apartment compound (Morales Puente, et al. 2012:Table XI.6), the leporids from offering contexts were much more enriched ($p<0.03$). These two rabbits, with $\delta^{13}C_{apatite}$ values of -10.8 and -9.9‰, would have contained 28% and 34% PC_4 respectively. As rabbits could easily be foraging along the edges of milpas as synanthropists, there may be varying degrees of C_4 plants into a leporid's diet. However, elevated percentages, reaching up to 86% shows a much heavier reliance on this staple that would not occur in a natural environment.

The collagen values for the leporids were within the average range in $\delta^{13}C_{collagen}$ value (-14.8‰ ± 1.6, 1σ) and represented the lowest values in $\delta^{15}N$ (5.2‰ ± 1.3, 1σ) (Figure 7.12). The latter was obviously because the leporids were one trophic level lower than the carnivores. These values were compared to four leporid remains from the Teopancazco apartment compound (Morales Puente, et al. 2012:Table XI.6) with values between -19.9 to -15.3‰ ($\delta^{13}C_{collagen}$) and 2.5 to 8.0‰ ($\delta^{15}N$). There was a statistical difference between the $\delta^{13}C_{collagen}$ distribution of the Teopancazco materials and those from offering contexts ($p<0.05$), the former being more negative, and thus reflecting a more accurate depiction of the C_3 vegetation present in the Teotihuacan valley.

Patterns in Human-Animal Interactions through the Isotopic Evidence

The preliminary dataset examined for each species above is already providing very positive results, confirming some of the zooarchaeological data discussed in previous chapters. The isotope ratios for apatite ($\delta^{13}C_{ap}$ and $\delta^{18}O$) had marked inter-species differences (Figure 7.13), while the collagen data ($\delta^{13}C_{col}$ and $\delta^{15}N$) was not as clear with the exception of the herbivorous leporids (Figure 7.14). The distribution of $\delta^{13}C_{ap}$ in particular was bimodal with a gap separating two clusters that seemed to demark animals based on a C_3 based diet (wild animals) and those with elevated $\delta^{13}C_{ap}$ values corresponding to a mix diet including high levels of C_4 plants (managed animals) (Table 7.5). Let us examine this separation further to look at interspecies differences.

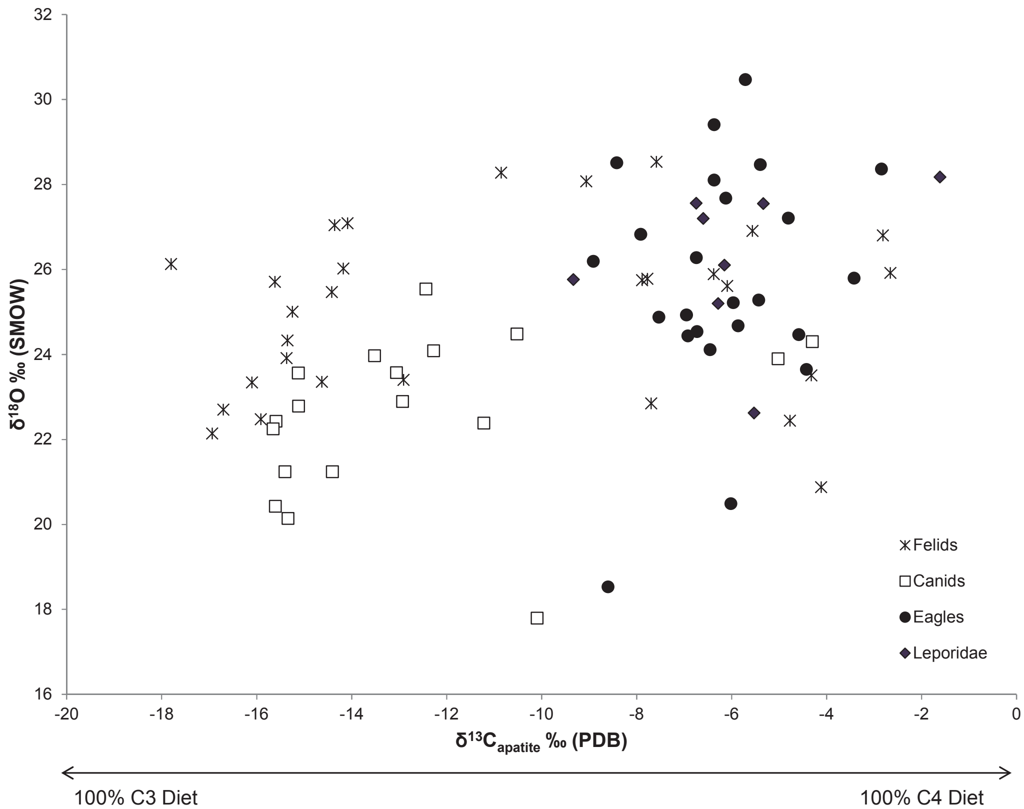


Figure 7.13 Bone apatite δ^{18}O and $\delta^{13}C_{apatite}$ values of all animals from offerings.

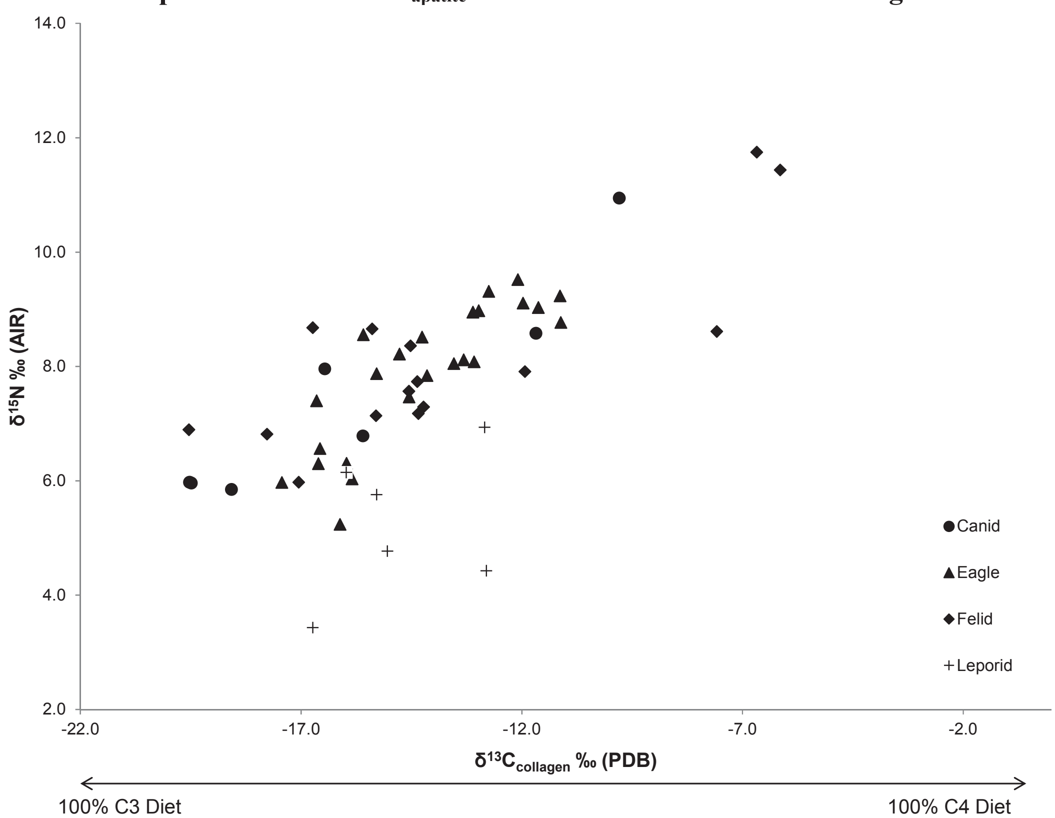


Figure 7.14 Bone collagen δ^{15}N and $\delta^{13}C_{collagen}$ values of all taxa from offerings.

Table 7.5 Summary of bone apatite and collagen values for each animal. See Appendix H.

Elemento #	Species	Burial	Bone	15 N col	13C col	13Cap	18Oap	%C4	Captive?
209	*Canis lupus*	OF2	Cranium	8.6	-11.7	-5.0	23.9	64	Poss
213.1	*Canis lupus*	Ent.2	Tooth	-	-	-12.9	22.9	15	No
572	*Canis lupus*	Ent. 3	Tooth	-	-	-12.3	24.1	19	No
573.1	*Canis lupus*	Ent. 3	Tooth	-	-	-15.6	22.4	-2	No
575	*Canis lupus*	Ent. 3	Tooth	-	-	-15.6	20.4	-2	No
579.1	*Canis lupus*	Ent. 3	Tooth	-	-	-13.5	24.0	11	No
597.1	*Canis lupus*	Ent. 3	Tooth	-	-	-15.1	23.6	1	No
606	*Canis lupus*	Ent. 3	Tooth	-	-	-15.3	20.1	0	No
642	*Canis lupus*	Ent. 3	Tooth	-	-	-15.7	22.3	-2	No
1508	*Canis lupus?*	Ent. 5	Tooth	-	-	-15.1	22.8	1	No
1636.2	*Canis lupus*	Ent. 5	Tooth	-	-	-13.1	23.6	14	No
1959	*Canis latrans*	Ent.6	Cranium	8.0	-16.5	-11.2	22.4	26	Unkwn
2072	*Canis lupus*	Ent.6	Cranium	5.8	-18.6	-10.5	24.5	30	Unkwn
2079	*Canis lupus*	Ent.6	Tooth	-	-	-14.4	21.2	6	No
2194	*Canis lupus*	Ent.6	Tooth	-	-	-15.4	21.2	-1	No
2199	*Canis lupus?*	Ent.6	Tibia	10.9	-9.8	-4.3	24.3	69	Yes
2224	*Canis lupus*	Ent.6	Tooth	-	-	-12.4	25.5	18	No
2244	*Canis lupus*	Ent.6	Cranium	6.0	-19.5	-10.1	17.8	33	Unkwn
81.1	*Aquila chrysaetos*	Ent.2	Phalange	9.0	-11.6	-6.9	24.4	52	Poss
120	*Aquila chrysaetos*	Ent.2	Phalange	8.8	-11.1	-3.4	25.8	74	Yes
121	*Aquila chrysaetos*	Ent.2	Phalange	8.2	-14.8	-6.7	26.3	53	Poss
144	*Aquila chrysaetos*	Ent.2	Phalange	7.9	-15.3	-6.0	25.2	58	Poss
165.1	*Aquila chrysaetos*	Ent.2	Phalange	5.2	-16.1	-6.7	24.5	54	Poss
191	*Aquila chrysaetos*	Ent.2	Phalange	6.3	-16.6	-8.6	18.5	42	Poss
196	*Aquila chrysaetos*	Ent.2	Phalange	6.0	-17.4	-7.5	24.9	49	Poss
211.1	*Aquila chrysaetos*	OF2	Phalange	8.5	-14.3	-2.8	28.4	78	Yes
283.1	*Aquila chrysaetos*	Ent.2	Phalange	9.0	-13.1	-5.4	25.3	62	Yes
309.1	*Aquila chrysaetos*	Ent.2	Phalange	8.6	-15.6	-7.0	24.9	52	Poss
1888	*Aquila chrysaetos*	Ent.6	Phalange	-	-	-5.7	30.5	60	Poss
1961	*Aquila chrysaetos*	Ent.6	Phalange	9.3	-12.8	-6.0	20.5	58	Poss
1983	*Aquila chrysaetos*	Ent.6	Phalange	6.3	-16.0	-8.4	28.5	43	Poss
2010	*Aquila chrysaetos*	Ent.6	Phalange	7.5	-14.6	-6.4	28.1	56	Poss
2047	*Aquila chrysaetos*	Ent.6	Phalange	8.1	-13.3	-4.6	24.5	67	Yes
2069.1	*Aquila chrysaetos*	Ent.6	Phalange	6.6	-16.6	-8.9	26.2	40	Poss
2070	*Aquila chrysaetos*	Ent.6	Phalange	9.5	-12.1	-4.8	27.2	66	Yes
2192	*Aquila chrysaetos*	Ent.6	Phalange	9.0	-13.0	-5.4	28.5	62	Yes
2193	*Aquila chrysaetos*	Ent.6	Phalange	7.4	-16.6	-7.9	26.8	46	Poss
2200	*Aquila chrysaetos*	Ent.6	Phalange	7.8	-14.1	-6.4	29.4	56	Poss
2214	*Aquila chrysaetos*	Ent.6	Phalange	8.1	-13.5	-6.1	27.7	57	Poss
2239	*Aquila chrysaetos*	Ent.6	Phalange	9.2	-11.1	-4.4	23.6	68	Yes
2246	*Aquila chrysaetos*	Ent.6	Phalange	8.1	-13.1	-5.9	24.7	59	Poss
2261	*Aquila chrysaetos*	Ent.6	Phalange	6.0	-15.8	-6.5	24.1	55	Poss
143	*Felis sp.*	Ent.2	Tooth	-	-	-4.3	23.5	69	Yes
154	*Puma concolor*	Ent.2	Femur	8.7	-18.1	-4.1	20.9	70	Yes

Table 7.5 Continued.

Elemento #	Species	Burial	Bone	15 N col	13C col	13Cap	18Oap	%C4	Captive?
270	*Felis sp.*	Ent.2	Tooth	-	-	-15.2	25.0	0	No
560	*Puma concolor*	Ent. 3	Tooth	-	-	-15.4	24.3	0	No
571	*Puma concolor*	Ent. 3	Cranium	7.9	-11.9	-14.6	23.4	4	No
620.1	*Puma concolor*	Ent. 3	Tooth	-	-	-12.9	23.4	15	No
632.1	*Puma concolor*	Ent. 3	Tooth	-	-	-16.7	22.7	-9	No
632.2	*Puma concolor*	Ent. 3	Mandible	-	-	-15.4	23.9	0	No
1381.1	*Panthera onca*	Ent. 5	Tooth	-	-	-17.8	26.1	-16	No
1382.1	*Felis sp.*	Ent. 5	Tooth	-	-	-15.6	25.7	-2	No
1382.3	*Felis sp.*	Ent. 5	Tooth	-	-	-16.9	22.1	-10	No
1500	*Puma concolor*	Ent. 5	Tooth	-	-	-14.4	27.0	6	No
1505	*Felis sp.*	Ent. 5	Tooth	-	-	-15.9	22.5	-4	No
1587.1	*Felis sp.*	Ent. 5	Tooth	-	-	-14.2	26.0	7	No
1587.2	*Felis sp.*	Ent. 5	Tooth	-	-	-16.1	23.3	-5	No
1639	*Puma concolor*	Ent. 5	Tooth	-	-	-5.6	26.9	61	Poss
1818.1	*Puma concolor*	Ent.6	MTII	11.8	-6.7	-2.7	25.9	79	Yes
1887	*Panthera onca*	Ent.6	Cranium	8.4	-14.5	-7.8	25.8	47	Poss
1941	*Puma concolor*	Ent.6	Tooth	-	-	-14.4	25.5	6	No
1984	*Puma concolor*	Ent.6	Cranium	11.4	-6.1	-2.8	26.8	78	Yes
1991.1	*Felis sp.*	Ent.6	Falange	7.6	-14.6	-6.4	25.9	56	Poss
2043	*Panthera onca*	Ent.6	Cranium	6.9	-19.5	-10.9	28.3	28	No
2068	*Puma concolor*	Ent.6	Tooth	-	-	-7.7	22.9	48	Poss
2195	*Panthera onca*	Ent.6	Cranium	8.7	-15.4	-7.9	25.8	46	Poss
2227	*Puma concolor*	Ent.6	Astragalus	7.3	-14.2	-6.1	25.6	58	Poss
2245	*Puma concolor*	Ent.6	Cranium	6.0	-17.1	-9.1	28.1	39	Unkwn
151, 309, 315	*Puma concolor*	OF2	Cranium	6.8	-17.8	-7.6	28.5	48	Poss
N4-31	*Panthera onca*	Ent.6	Tooth	-	-	-14.1	27.1	8	No
211.2	*Sylvilagus sp.*	OF2	Tibia	4.4	-12.8	-1.6	28.2	86	Yes
213.2	*Leporidae*	Ent.2	Vert.	3.1	-17.6	-9.3	25.8	37	Unkwn
283.2	*Sylvilagus sp.*	Ent.2	Ulna	5.6	-15.9	-6.7	27.6	53	Poss
1818.2	*Sylvilagus audobonii*	Ent.6	Tibia	5.8	-15.3	-5.5	22.6	61	Yes
1818.3	*Sylvilagus audobonii*	Ent.6	Humerus	4.8	-15.0	-5.3	27.5	62	Yes
1991.2	*Sylvilagus sp.*	Ent.6	Tibia	6.1	-16.0	-6.3	25.2	56	Poss
2069.2	*Sylvilagus floridanus*	Ent.6	Femur	6.9	-12.8	-6.6	27.2	54	Poss
1818.2/.3	*Sylvilagus audobonii*	Ent.6	Tooth	-	-	-6.2	26.1	57	Poss

Within the apatite data, felids exhibited the largest amount of variation, clearly demarking two groups based on $\delta^{13}C_{ap}$ values, one centered on -15‰ and another around -6‰. Felid average $\delta^{13}C_{ap}$ was -10.9‰ ± 5 (1σ) that contained the largest standard deviation among all the animals that reflects the variability in the binomial distribution (Table 7.6). The animal with the highest C_4 signature based on the $\delta^{13}C_{ap}$ average value were the Leporidae averaging -5.9‰ ± 2.1 (1σ), the highest value reaching up to -1.6‰ that corresponded to 86% reliance on C_4 plants. On the other hand, canids exhibited the lowest

Table 7.6 Apatite and collagen average values and standard deviations for each animal type.

		$^{13}C_{ap}$	$^{18}O_{ap}$	$^{13}C_{col}$	$^{15}N_{col}$
Felid (29 apatite, 15 collagen)					
	Average	-10.9	25.0	-13.7	8.1
	Stand	5.0	2.0	4.0	1.6
	Range	-17.8 to -2.7	20.9 to 28.5	-17.8 to -6.1	6 to 11.8
Canid (18 apatite, 7 collagen)					
	Average	-12.6	22.6	-15.9	7.4
	Stand	3.4	1.9	3.8	1.9
	Range	-15.7 to -4.3	17.8 to 25.5	-19.5 to -9.8	6 to 10.9
Eagle (24 apatite, 24 collagen)					
	Average	-6.2	25.8	-14.2	7.9
	Stand	1.5	2.7	1.9	1.2
	Range	-8.9 to -2.8	18.5 to 30.5	-17.4 to -11.1	5.2 to 9.5
Leporidae (8 apatite, 6 collagen)					
	Average	-5.9	26.3	-14.8	5.2
	Stand	2.1	1.8	1.6	1.3
	Range	-9.3 to -1.6	22.6 to 28.2	-16.7 to -12.8	3.4 to 6.9

average at -12.6‰ ± 3.4 (1σ). The $\delta^{18}O$ value gathered from the apatite overlapped significantly ranging between 17.8 and 30.5‰. The eagles had the largest range (18.5 to 30.5‰) while the canids contained the lowest average at 22.6‰. An interspecies analysis of oxygen data is highly problematic as body physiology significantly affects the O isotopic ratio. For example, canids pant to control body heat that may be the partial cause for their low oxygen values. Thus this dataset will be interpreted in more detail in the future consulting information about the body physiology and range in local water sources.

The $\delta^{13}C_{col}$ values overlapped significantly between taxa, their averages ranging between -13.7 and -15.9‰ (Table 7.6). A scatter plot of their distribution demonstrates a cluster from -11 to -19‰ and four outliers; one canid and three felids with values as high as -6.1‰. In particular, $\delta^{15}N$ ratios were fairly consistent among the carnivores, averaging between 7.4 to 8.1‰, and the herbivorous leporids were an expected trophic level lower from these carnivores with a mean of 5.2‰ ± 1.3 (1σ). The range of variation in the $\delta^{15}N$ values suggests a spectrum of $\delta^{15}N$ values of the food source, most likely reflecting different trophic levels. Various levels of carnivory and omnivory were probably practiced among even some of the specialized carnivores like the felids and eagles. This was expected among wolves that

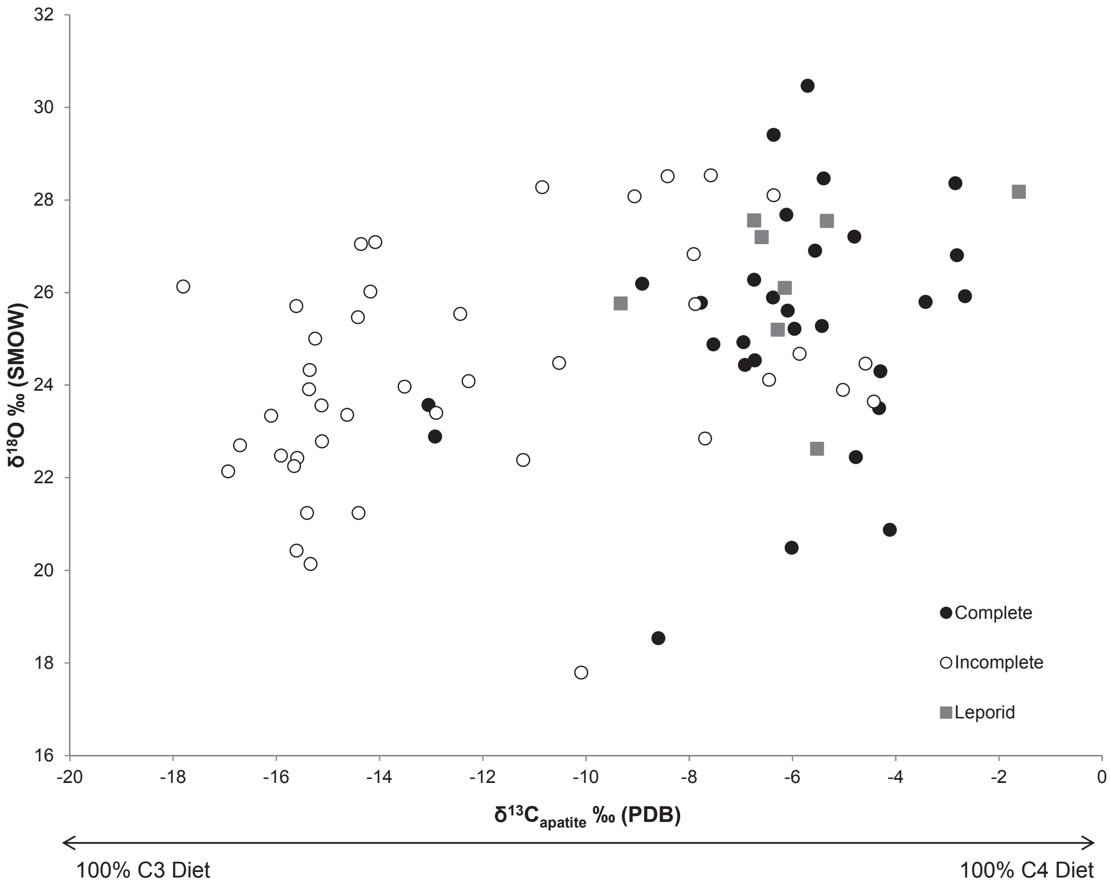


Figure 7.15 Bone apatite $\delta^{18}O$ and $\delta^{13}C_{apatite}$ values of all animals from offerings comparing complete, incomplete, and Leporid samples.

tolerate high levels of omnivory as observed in its domesticated form, the dog. However, it was surprising to find carnivore ranges that fell within the distribution of omnivorous scavengers like the dog value from Teopancazco (9.9‰) and even some of the high leporid values (6.9‰) among specialized carnivores such as the felids (6‰ lowest value) and eagles (5.2‰ lowest value).

Isotopic inter-species variation confirms the presence of a heterogeneous diet among the animals interred in the offering. This is exemplified most clearly in the $\delta^{13}C_{apatite}$ values of incomplete versus complete skeletons, where the latter tended to be significantly more enriched ($p<0.001$) (Figure 7.15). This pattern is even more accentuated if we consider the leporid materials as complete, despite the incomplete skeletal remains, because they were probably consumed whole but only a portion of their skeleton was found.

There was a large concentration of complete individuals with highly enriched $\delta^{13}C_{apatite}$ values reaching up to -2.7‰, with the exception of two outliers (both canids); corresponding to animals that were consuming up to 79% C_4 plants. The uniformity among the primary burials suggests that animals selected for sacrifice tended to be those that were consuming high levels of C_4 plants, most likely as a result of confinement. This goes hand in hand with the vivid pathological indicators already discussed in Chapter 5 that was a result of the sacrificed individuals being kept in confinement.

On the other hand, the variability observed among the secondary deposits is striking, ranges extending from an absolute reliance on C_3 diets, to those with up to 64% C_4 based diets (excluding leporids and eagles). Although the majority of the secondary deposits were based on C_3 diet, suggesting there were variations in the degree of human contact and confinement among the animals prepared as ritual paraphernalia; the majority were probably were from a wild population (A in Figure 7.1) while some were of animals kept in confinement to varying degrees. Since there was also variability in the surface modification among such prepared elements, some exhibiting obvious markers of being prepared while the skin was still attached to the head while others had no such surface features, there may have been different points in which humans came in contact with the animal; wild hunted/captured animals or as bare skeletons that were then processed.

The collagen isotopic values similarly had a significant separation when primary versus secondary deposits were plotted; $\delta^{13}C_{collagen}$ $p<0.001$, $\delta^{15}N$ $p<0.005$ (Figure 7.16). The complete deposits tended to be more enriched in both $\delta^{13}C_{collagen}$ and $\delta^{15}N$, indicating that sacrificed animals were consuming both more C_4 based resources in its dietary protein as well as more meat protein (B in Figure 7.1).

This distinction between primary and secondary burials is probably the cause of the clear separation observed between Entierros 2 and 6, which contained the largest number of primary burials, and Entierros 3 and 5, where no or very few primary burials were found (Figure 7.17). Entierros 3 and 5 had the lowest $\delta^{13}C_{apatite}$ values, ranging from -17.9 to -12.3 (average -14.7±1.4, 1σ) excluding an outlier of a complete puma from Entierro 5 (Elemento 1639) with a $\delta^{13}C_{apatite}$ value of -5.6‰. This average suggests a complete reliance on C_3 among the fauna from Entierros 3 and 5, with the exception of

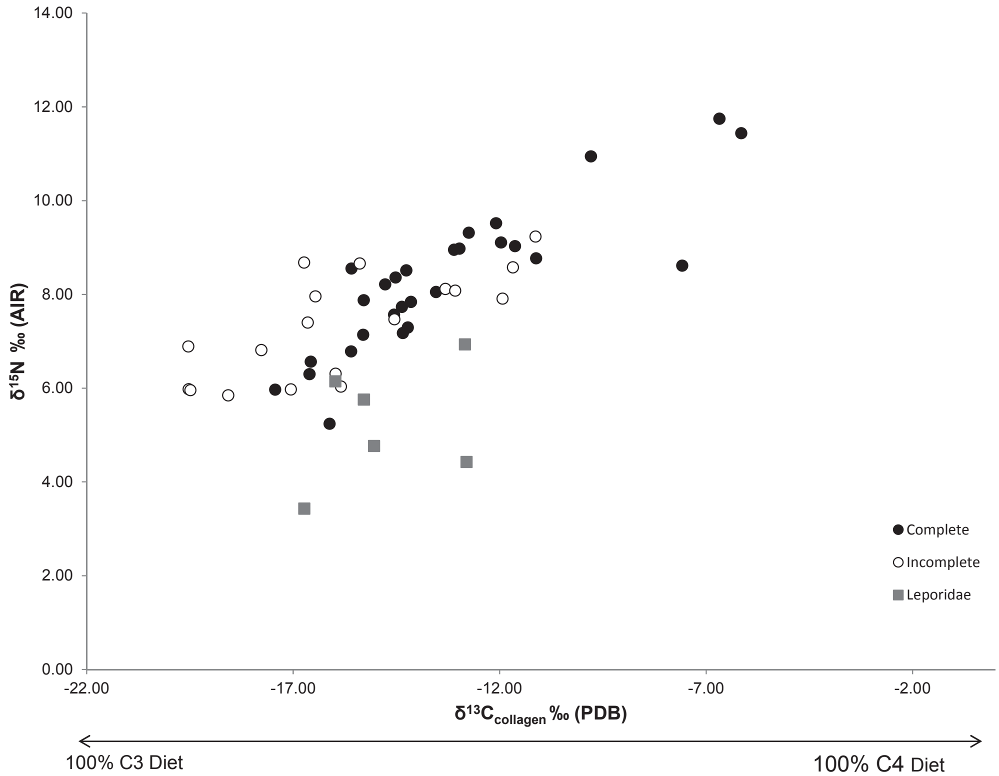


Figure 7.16 Bone collagen $\delta^{15}N$ and $\delta^{13}C_{collagen}$ values of all animals from offerings comparing complete, incomplete, and Leporid samples.

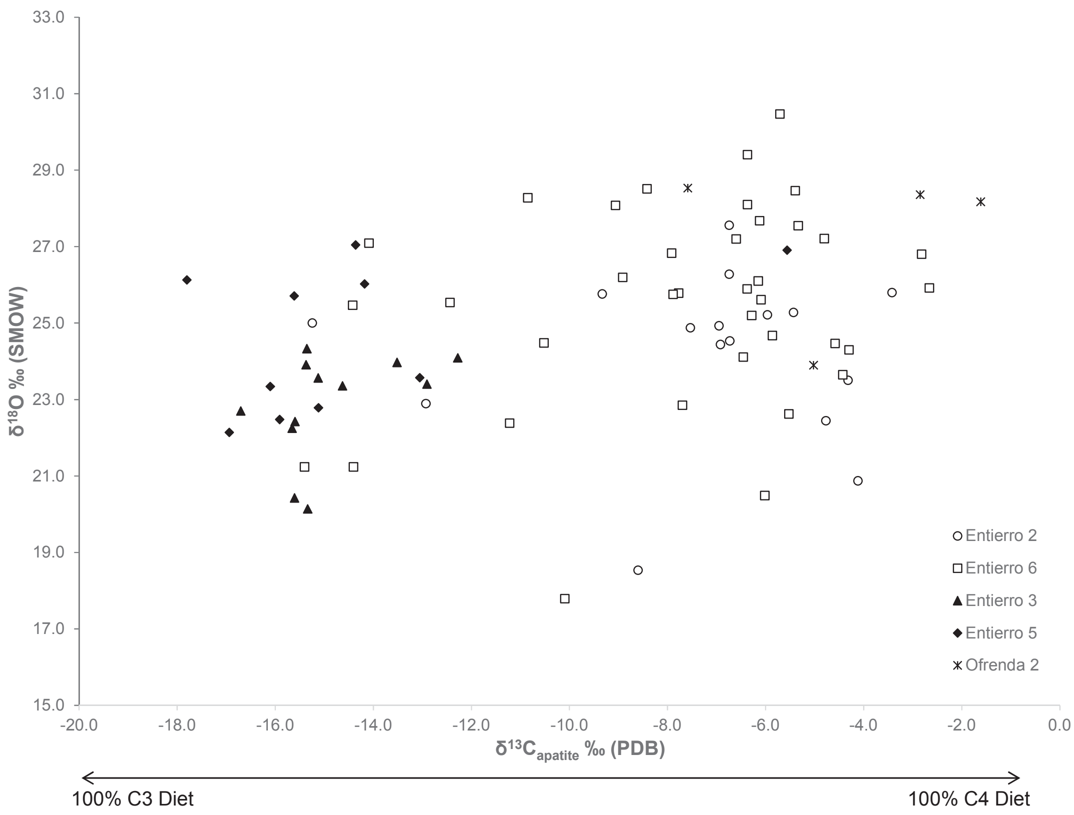


Figure 7.17 Bone apatite $\delta^{18}O$ and $\delta^{13}C_{apatite}$ values of all animals from each of the offerings.

the primary puma that consumed 61% C_4 based diet. On the other hand, animals deposited in Entierros 2 and 6 contained a very wide distribution of $\delta^{13}C_{apatite}$ values, ranging from -15.4 to -2.7 (average -7.6±3.2, 1σ). This corresponds to a range of C_4 dietary input from none (complete C_3 diet) to 79%. Interestingly, Ofrenda 2 fauna more closely resemble elevated $\delta^{13}C_{apatite}$ values of Entierros 2 and 6. From the apparent highly enriched $\delta^{13}C_{apatite}$ values from Entierros 2, 6 and Ofrenda 2, it can be argued that there were chronological changes in carnivore management during different periods of Teotihuacan occupation.

In order to test the hypothesis stated in the beginning of this chapter concerning the duration of the animal's stay in the city confines, a puma skeleton with clear indication of being in confinement from both zooarhcaeological and isotopic evidence (Elemento 1818) was examined. Both a bone (metatarsal II) and a tooth (maxillary third premolar) were sampled for isotopic analysis. Their $\delta^{13}C_{apatite}$ values were -2.7‰ and -5.1‰ (after teeth correction) respectively that corresponds to 79% and 64% C_4 dietary input.

Unfortunately, tooth eruption sequence are only published for pumas up to eight months of age, when their permanent incisors and canines appear (Currier 1983; Currier 1979). By two years of age, the animal's dentition has reached its full size and little variation is observed (Gay and Best 1996). The tooth sampled, a permanent upper third premolar, begins to erupt around six months of age among modern lynx (Crowe 1975:Table 2) and between 8-10 months in leopards (Stander 1997:Table 1). Thus the puma sampled most likely reflects its diet sometime before this tooth erupts a little after eight months of age. By this time it was already starting to consume over half C_4 based diet, probably eating rabbits with high C_4 input. While it is tempting to argue that the animal was bred in captivity (Hypothesis H3 in Figure 7.1), further samples of even earlier forming teeth are necessary to distinguish if the carnivore was bred in captivity or caught as a cub during its early infancy. It does demonstrate that some of the animals were brought into the city confines as young cubs/chicks to be raised to become ultimate sacrificial victims.

The above analysis of the isotopic composition of the fauna utilized in dedicatory rituals provided another line of evidence strengthening the zooarchaeological indicators that reported the presence of a mixed population of both captive animals and hunted wild animals. As demonstrated by the comparative samples of modern wild animals and archaeological samples, the isotopic variation found in the offering caches reflect both animals based on wild C_3 environment and other archaeological data of individuals known to be confined, sometimes starting as young, in captivity on a maize based diet.

The data confirm a significant difference between primary and secondary deposits that indicate sacrificed animals were often kept in captivity, fed on a C_4 based diet. Interestingly increased C_4 input also correlated with $\delta^{15}N$ enrichment, suggesting increasing levels of carnivory. On the other hand, low $\delta^{15}N$ values were recorded among many specialized carnivores with low $\delta^{13}C_{collagen}$ values, suggesting that increased levels of omnivory do not necessarily signify captive behavior. This patterning was present among secondary deposits with low $\delta^{13}C_{collagen}$ values that reflect C_3 based diets that also contained very low $\delta^{15}N$ values, suggesting wild populations tolerated variable degrees of omnivory. On the other hand, a small proportion of secondary burials also exhibited fairly large ranges of enriched $\delta^{13}C$ (apatite and collagen) and $\delta^{15}N$ values. This suggests that among prepared faunal paraphernalia, some animals that were also kept in confinement were manipulated post-mortem to be used as offerings. This was particularly true among prepared eagle populations that could not be distinguished isotopically from primary deposits.

As a continuation of this study, dietary models will be generated utilizing both a simple carbon model (Froehle, et al. 2010; Kellner and Schoeninger 2007) and a multivariate model (Froehle, et al. 2012) that will compute the degree of C_3/ C_4 plant resources from both total diet and protein, as well as the protein source (marine/terrestrial), based on meta-analyses of experimental data. This model has been successfully applied among archaeological Maya human remains to look at changes through time in Maya dietary patters among status groups (Somerville, et al. 2013). Such a model would be useful in this Teotihuacan case where there are different variables of degree of carnivory, direct vegetal composition, and the carbon signal of the protein source that have already showed they are linked to this clear pattern between complete and incomplete animals.

Chapter 8

Reconstructing Ritual Performance: Spatial Patterning

This chapter focuses on overall patterns within and between offertory contexts. Species diversity, spatial patterning and seasonality are discussed for each cache to define chronological trends in animal use. In particular the similarities between Entierros 2 and 6, constructed in the fourth building stage of the Moon Pyramid are considered. This assemblage is contrasted to Entierros 3 and 5 that had a very distinct faunal distribution. Materials from Ofrenda 2 of the Sun Pyramid are also examined looking at chronological parallels as well as their differences.

Species diversity and distribution pinpoint key actors of a ritual spectacle. The zooarchaeological investigation resulted in identifying 19 species, 18 genus, and 14 families of mammalian, avian and reptilian fauna from the dedicatory caches (Table 5.1). While there were variations in species representations between offortory contexts, there were a core set of prominent actors that were repeatedly utilized in state rituals that represent the most prominent carnivores of the sky (eagles), earth (wolves, pumas, and jaguars), and liminal spaces (rattlesnakes). Even within these actors, there were differences in both the species that were most prominently displayed from different contexts, as well as variation in preparation methods and the quantity of each species.

Some offerings focused on different species over others. The apparent emphasis on canid remains in Entierro 3 is a good example. Here, prepared wolf skulls and claws not only outnumbered any other species, but their position in close association to the four sacrificial victims referenced the identity of the human captives. Characterizing the distribution and use of each species between offerings and within a specific cache made it possible to recreate the selection process that determined why specific species were chosen and the reasons they were deposited in the manner and location observed.

Spatial patterning can inform how fauna were utilized to orient the ritual space. In many cases, it demonstrates the care in which each individual was deposited in association to other artifacts. For each offering the spatial layout of specific species and sexes are examined to determine what attributes were important or avoided. This analysis examines the selection process pinpointing what characteristics of the animals were meaningful or essential to founding key symbols for the ritual spectacle.

Summarizing the zooarchaeological and isotopic data I highlight overall patterns in the distribution and use of animals across the offertory contexts. Individual life histories are reconstructed with such depth including not only the taxa, age, and sex of the animal, but also how the animal was captured, if the animal had directly interacted with humans, what it ate, how it died, and many other taphonomical details. Comparing two examples of a life history reconstruction, one primary and another secondary burial, a model of the ritualization process is proposed along with the zooarchaeological and isotopic correlates that help define the material traces of such actions. In the final section of the chapter, inter- and intra-offering differences in animal use are proposed.

Moon Pyramid: Entierro 2

As explained in Chapter 3, Entierro 2 was one of the first chambers placed in the Moon Pyramid during the construction of Building 4 along the base. This offering and Entierro 6 together mark the enlargement of the mound into a monumental platform. Considering the elaborate ritual spectacles which accompanied this transformation, it is no surprise that these two offerings contained some of the most diverse and ubiquitous zooarchaeological datasets. The abundance of fauna and its spatial layout, carefully placing live sacrificial victims as well as prepared artifacts in the ritual space, demonstrate that Entierros 2 and 6 particularly focused on animals as central actors of the ritual spectacle.

Species Diversity

Entierro 2 exhibited one of the richest examples of species diversity: ten species distributed among eleven genera (Table 5.1). The golden eagle (*Aquila chrysaetos*) was the most abundant species represented, where nine complete individuals were found neatly placed around the offering. Avian diversity was particularly noticeable in this chamber, which included other raptors such as the great horned owl (*Bubo virginianus*), hawk (*Buteo* sp. and *B. jamaicensis*), common raven (*Corvus corax*), and prairie falcon (*Falco mexicanus*). These raptors were not whole but instead represented mainly by their extremities, suggesting they were probably prepared specimens. Many of these other raptors were located on the eastern sector of the dedicatory chamber, mostly in the vicinity of the eagle, Elemento 81. There was also diversity in small game found in the stomach content and/or fill material. Hare (*Lepus* sp.), rabbit (*Sylvilagus* sp., *S. audubonii* and *S. floridannus*), and rodent (*Peromyscus maniculatus*) bones were found both in secure contexts in the intestinal tract of the sacrificed animal, or in the fill matrix.

Particularly stunning among the faunal assemblage from Entierro 2 were the caged carnivores, identified by the post holes that confined the beasts which were discovered at the northern and southern sectors of the chamber. A puma (*Puma concolor*) inhabited each of the two superimposed cages while another enclosure housed a wolf (*Canis lupus baileyi*). These caged carnivores provide some of the most convincing evidence that the fauna from this offering were buried alive, as only live animals would have necessitated confinement at the time of deposition. The presence of coprolites from these caged beasts add to this evidence. Besides these two complete pumas, four felid crania were deposited in the dedictory chamber, one of which was identified as a puma. All of these individuals were either infant or juvenile, making the species level identification very challenging due to the lack of access to young crania for comparison and identification.

Along with the mammalian and avian remains, a concentration of reptilian bones were discovered at the center of the offering, immediately to the west of the radiating eccentrics around a pyrite disk. Laboratory sorting and analysis concluded that at least six rattlesnakes (*Crotalus* sp.) were represented by many vertebrae, ribs and six pairs of mandibles. While there is no way to confirm that they were complete individuals, due to the abundance of all body parts (cervical, thoracic and caudal vertebrae, ribs and cranial elements), we assume most if not all of the rattlesnake were deposited complete. Distributed in a confined area, it is possible that these rattlesnakes were originally in a container made of organic material, perhaps a bag or basket that deteriorated. This is highly likely considering the presence of a well preserved circular basket from Entierro 6 with rattlesnake remains in its interior.

Spatial patterning

These key actors oriented the ritual space as they were found strategically positioned in the offering. Most noticeable was the distribution of eagles, which somewhat paralleled Entierro 6; eagles

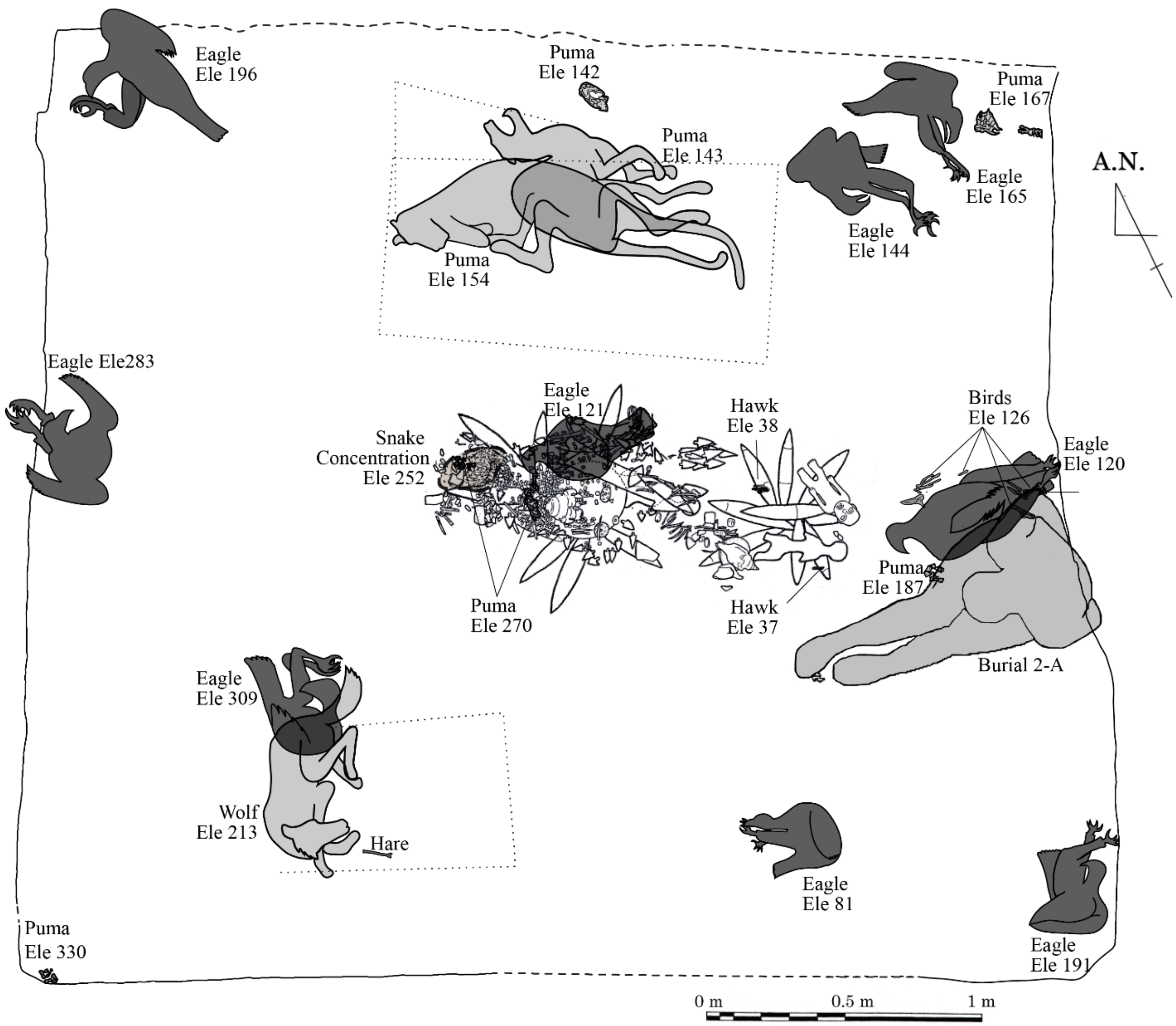


Figure 8.1 Plan view of Entierro 2 with outlines of animal bodies. Human sacrificial victim and border drawn by S. Sugiyama, animal outlines drawn by N. Sugiyama.

were placed roughly along axial, inter-axial lines and at the center of the chamber (Figure 8.1). Unlike Entierro 6, each of these points was marked by one eagle instead of a pair. The similarity observed here is not surprising, as these two offerings were roughly contemporaneous dating to the fourth building phase, and was probably designed in unison. It is interesting that the distribution of eagles in this chache was somewhat regularized, and yet some individuals were noticeably irregular, located off-center or displaced from the corners. For example, an eagle (Elemento 309) was found underneath the caged wolf skeleton. Most likely, judging from the presence of the other three eagles found on the corners of the cache, this individual was meant to be placed on the southwestern corner. Why this individual moved, or was dragged towards the wolf cannot be explained. One possibility is that because some of the fauna were buried alive, the animals could have shifted from their original placement. The caged wolf and pumas were found roughly along the midpoint along the north-south axis. As a result, the complete individuals were placed in cardinal and inter-cardinal points and at the core.

Two sets of bifacial knives radiated around two central greenstone figurines at the center of the dedicatory cache. These artifacts also functioned to orient the ritual space as they were placed along cardinal and inter-cardinal directions similar to the fauna found in the cache. As Sugiyama and López-Lujan (2007) have argued, the number of obsidian bifaces and fauna were the same. There were two groupings of nine bifaces that totaled 18 knives deposited in this offering. Similarly there were three caged animals and six rattlesnakes that included nine complete non-eagles and nine eagles totaling 18 sacrificial animals. The 18 obsidian bifaces and sacrificial animals oriented the spatial-temporal axis, as 18 is a highly significant number in Mesoamerican cosmological systems that represent the different layers of the upperworld and underworld, as well as relating to their calendric cycle (Sugiyama and López Luján 2006b).

Two complete felid skeletons, one male and one female, were paired in the northern sector inside two cages placed on top of each other. In the southern sector, a male wolf was caged while nearby a female eagle was found below this canid, again pairing male and female animals. Looking at the eagles whose sex was identified with certainty (excludes Elementos 165and 144 possible females), females were found on the western sector of the chamber (Elementos 309 and 196) while males were found on the eastern sector (Elemento 120 and 121). These two possible females were identified arbitrarily based on the general impression of size of the individual, although incomplete tarsometatarsus width made accurate sex determinations impossible. Furthermore, one of the individuals was considered a possible young adult, which makes this gender identification difficult to trust. In continuation I discuss how the more prevalent gender distribution in Entierro 6 parallels the arrangement observed in Entierro 2.

Seasonality

Two species, the eagle and the wolf, provide valuable insight into the timing of the ritual event. Among all the eagles examined from the various contexts, Entierro 2 was the only case where primary burials of young eagles were documented. This is because eagle chicks grow at an exceptional pace, reaching adult size by three months. On the flip side, once a young individual is identified, it is possible to reconstruct a tight estimate of seasonality. The presence of at least one infant/juvenile and a few possible juvenile eagles indicate the ritual most likely took place when they were roughly two months old. Since these eagles hatch between April to early May, internment was estimated to have occurred sometime between June and July.

The remains of a juvenile wolf, six to nine months old, found from the same context somewhat contradicted this seasonal designation. Wolves generally go into heat in the winter, after which point they enter their gestation period that lasts about two months, with birth following in the spring (February to April) (Blanco Padilla, et al. 2009). Calculating the six to nine month age of Elemento 213, it suggests the ritual probably took place between August and January. However, wolf breeding season is more heavily dependent on prey availability and is much more variable than that of an eagle. Its domesticated form, the dog, breed year round. Thus seasonality should more heavily rely on eagle age ranges that have more restricted breeding season and age estimates. Together, the age of the young eagle and wolf suggest that the burial took place sometime during the summer to late summer (June-August) during the rainy season.

Moon Pyramid: Entierro 6

Fauna from Entierro 6 represents the largest example of animal mass-sacrifice and faunal use in state-sponsored rituals at Teotihuacan. This context alone contained a minimum of 74 animals either sacrificed or deposited secondarily into the cache (Table 5.1). As this offering was constructed during the same building episode as Entierro 2, it would have been somewhat contemporaneous, but placed in the midst of the monumental construction upon reaching approximately 15 m high. Together, the fauna utilized in these two caches would have numbered 118 individuals, suggesting an extensive amount of preparation to gather all the necessary animals for the ritual event.

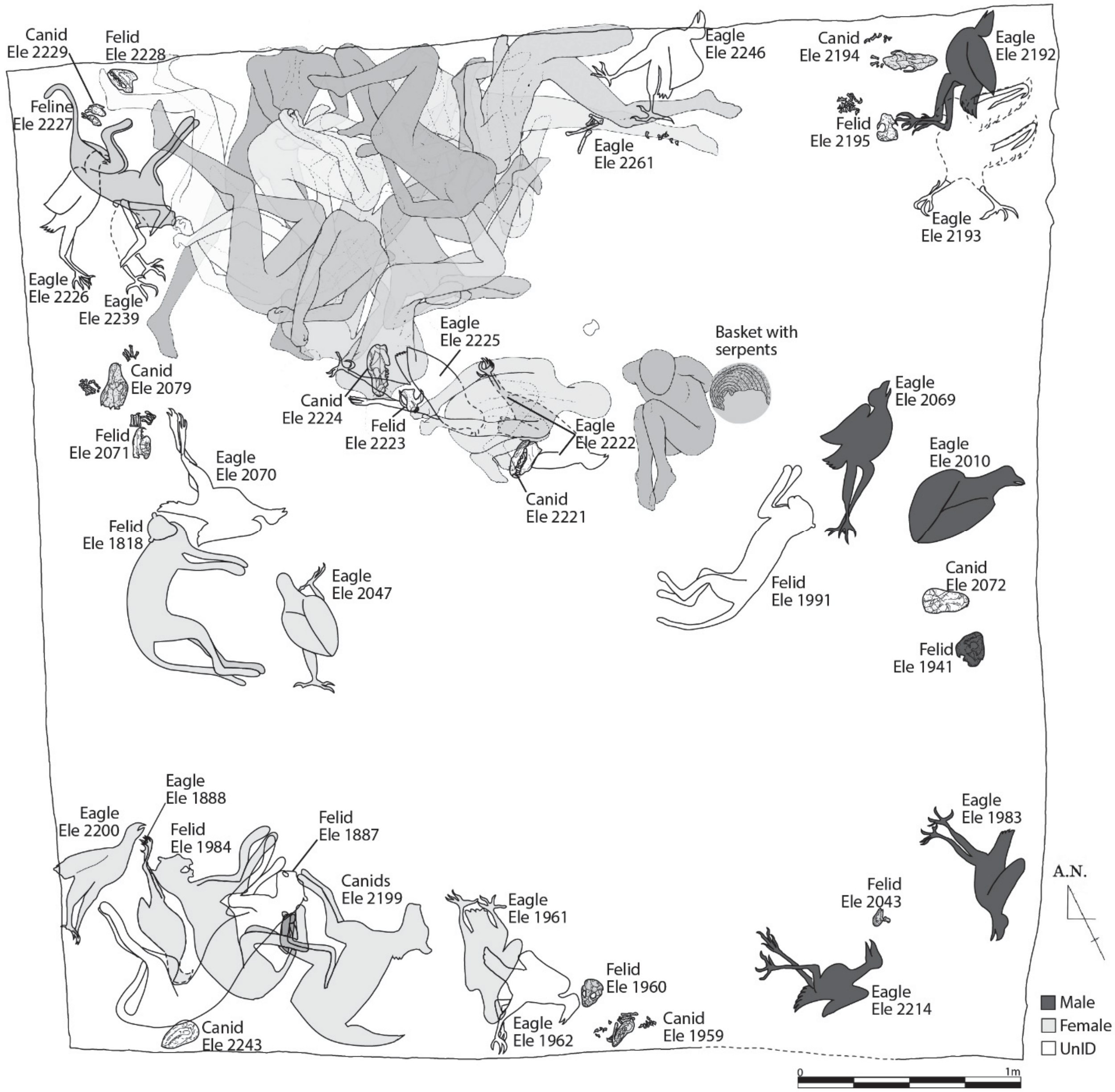


Figure 8.2 Plan view of Entierro 6 with outlines of animal bodies. Human sacrificial victim and border drawn by G. Pereira and S. Sugiyama, animal outlines drawn by N. Sugiyama.

While there was an overall even distribution of felid and canid crania throughout the offering, the majority of complete individuals were found in the western half of the chamber with the exception of Elemento 1991 that was excavated in the eastern sector (Figure 8.2). Complete animals particularly concentrated on the southwestern corner. Unfortunately this area with overlapping skeletons was badly preserved. There is an interesting parallel of the overlapping complete animals sacrificed at the southwestern corner to the piled human skeletal remains on the northwestern corner of the cache.

Comparing the species diversity and spatial layout it is apparent that these two offerings were planned in accordance to each other, with obvious parallels between not just the animal assemblage, but also other artifacts in the chamber (López Luján and Sugiyama 2008). Here some of the specific parallels between the two offerings are demonstrated, as well as how the two chambers — one positioned at the base along the tepetate floor and another placed above this in the midst of its construction — embedded highly symbolic fauna to orient the ritual space.

Species Diversity

The species diversity — ten species distributed among nine genera (Table 5.1) — and the layout somewhat mirror that of Entierro 2 with slight variations that fully utilize the expansive 5m^2 space. Eighteen golden eagles marked the most abundant species that included primary and secondary burials. Other avian species from the fill matrix such as the bobwhite quail (*Colinus virginianus*), inca dove (*Columbina inca*) and other unidentified bird elements were also documented.

A couple canid species were identified: the Mexican grey wolf (*Canis lupus baileyi*) and one coyote (*C. latrans*). The possibility of a hybrid between a wolf and dog (*C. lupus-familiaris*) was also discussed, a conclusion which is pending further analysis. While there are other cases of wolf-dog hybrids utilized as maxillary pendants at the Feathered Serpent Pyramid (Valadez Azúa, et al. 2002a; b), the compete coyote skeleton found in the present context is unique and has not been recorded in any other ritual contexts at Teotihuacan. Two species of felids were identified; the puma and the jaguar (*Panthera onca*) as both complete and prepared elements. Their identification, particularly of the jaguar remains, is pending further confirmation.

Abundant rattlesnakes were found inside a circular basket at roughly the center of the dedicatory cache (Figure 8.2). An MRI of the basket revealed numerous rattlesnakes piled inside the basket totaling approximately 18+ serpents. Species found in the stomach content of complete carnivores included the desert and eastern cottontails. Several bones of a Mexican gray squirrel (*Sciurus aureogaster*) were also found in the fill matrix. Other isolated mammalian remains were probably either fragments chipped off from other animals identified or isolated elements of fill refuge that could not be identified further.

Spatial patterning

The spatial layout of the offering was distinct from other contexts in that the sheer size of the chamber that resulted in areas with no or little artifacts. The majority of the dedicatory offerings were found as a large concentration in the somewhat northerly off-centered area where tlaloc vessels, large pyrite disks, obsidian eccentrics and two human skeletons were placed (Sugiyama and López Luján 2007). Most striking was the heap of beheaded human sacrificial victims piled along the northern wall. In contrast to this chaotic arrangement of human cadavers, the fauna were somewhat evenly distributed throughout the chamber (Figure 8.2).

Groupings of animals were identified at cardinal and inter-cardinal sectors and at the core of the chamber. Each grouping contained a pair of eagles, and variable numbers of canid/felid skulls and complete bodies. Most of the time a group was composed of one canid skull and one felid skull with a primary burial of a canid or felid, but this last component varied significantly. The southwestern corner of the cache, for example, encompassed two eagles, one canid head, a complete canid, and two complete felids. Most of the complete non-eagle skeletons were deposited along the western sector of the offering, with the exception of Elemento 1991, a complete felid skeleton in the eastern half.

A mark engraved on the ground found underneath the obsidian eccentrics may help explain the layout of these animals. Two circles with a line drawn in cardinal and inter-cardinal directions was incised. As López Luján and Sugiyama (2006) have argued, there is a vertical dimension to the caches and drawing this feature would have been one of the first acts in the dedicatory ritual, over which paired obsidian bifaces and eccentrics were carefully laid out. At the center of this assemblage, a pyrite disk was placed where a mosaic figurine stood. The arrangement of nine paired obsidian knives along these axial lines parallels the placement of eagles throughout the cache that are also deposited in pairs.

Another important pattern in the distribution of faunal remains from the offering is found among the sexed skeletons. Once the sex of the animals were determined, it became obvious that the

Teotihuacanos were intentionally differentiating between male and female skeletons. This pattern first emerged when the eagle's sex was assigned and female versus male eagles were plotted on the plan view drawings (Figure 8.2). As the most ubiquitous species with the largest number of sexed individuals, immediately there was a clear pattern; male skeletons were distributed on the eastern sector of the chamber while females were only found in the western half. Subsequent analysis of felid and canid skeletons derived similar results with one exception. One canid cranium, Elemento 2194, was identified as female even though it was found in the northeast corner. While other prepared skeletal elements, such as Elemento 1941 and 1959, still followed the sex division, the majority of the sexed skeletons were primary burials. It is likely that prepared skeletons such as Elemento 2194 that were extensively processed and secondarily deposited into the chamber were not sexed by the Teotihuacanos. Another possibility is that the identification of a fairly young adult, one to two years of age, could have been miss-identified during analysis due to its smaller size.

This data parallels the distribution of eagles in Entierro 2, which securely identified male and female eagles divided into east and west respectively. This evidence explicitly pinpoints intentionality in selecting a specific sex for the ritual offering. Furthermore, it demonstrates that the Teotihuacanos had exceptionally fine control over the carnivore population, able to select not only the necessary number of individuals to use (usually 18 or 9), but also the desired sex.

The selection process of primary burials is straight forward, as they were able to observe the sex of the live carnivores. For many of the secondary burials it would have been significantly more difficult to sex without the entire body. Especially for the eagles, the fact that both primary and secondary animals were divided along east-west sectors demonstrates that the sex of complete and prepared individuals was known at the time of interment. This is no easy feat, as exemplified by a recent publication that ran a component analysis to determine which measurements are most effective to determine the sex of modern Golden Eagles ―the hallux length and cranial length (Harmata and Montopoli 2013), both measurements that are unfortunately hard to take with fragmentary and disarticulated archaeological samples. It was necessary in this study to either visually confirm body position during copulation or run DNA tests to determine the sex of the raptor to conduct the subsequent statistical analysis. Teotihuacan ritual specialists who deposited these raptors according to sex did not utilize such analytical methods. They must have distinguished male and female eagles by general body size and through watching their actions, particularly during courtship, copulation and incubation. This suggests that primary and secondarily deposited eagles of known sex were probably carefully observed to confirm their sex while the animal was still alive. Such a process would have been most easily accomplished in confinement —a possibility that is strengthened by the presence of prepared eagle skeletons with both pathological indicators of disease that also contained extensive cutmarks.

Seasonality

One felid skeleton hinted at when the dedicatory ritual of Entierro 6 was conducted. One primary burial of a juvenile felid, between six and eight months old was identified. Assuming felids had regular birth cycles, felids usually gave birth between April and September. Therefore the dedicatory ritual must have taken place sometime between September and April. Mesoamerica's calendric cycle followed the major distinction between the wet and dry season. The dry season corresponds to the dates when the sun is found in the southern hemisphere between August 12th and April 29th (Sugiyama 2013b:6). Therefore, the dedicatory ritual of Entierro 6 took place during the dry season.

Moon Pyramid: Entierro 3

Entierro 3 was the only context composed solely of secondary deposits. The remain, mostly of canid and felid heads sometimes accompanied by the phalanges and claws, were dispersed around four sacrificed humans deposited in the chamber. Only two avian remains, both hawks, were also found in this offering. Such a deposit contrasts significantly from the previous two dedicatory caches (Entierros 2 and 6) in both species diversity and quantity of fauna represented. This is surprising given that this offering was deposited only about fifty years after Entierros 2 and 6 were interred during the subsequent fifth construction phase (A.D. 300±50). The lack of primary deposits of animals, the reduced species diversity, as well as the reduced number of animals in general all suggest that animals were not central to the function of the dedicatory ritual. Instead, the ritual spectacle most likely focused on the four sacrificial victims that took up the majority of the ritual space. The animals, in turn, were central to concreting the identity of these sacrificial victims.

Species Diversity

This offering contained the lowest species diversity, with only three species identified: the wolf, the puma, and the hawk (Table 5.1). There was an emphasis on wolf remains, consisting of an MNI of 17. This cache exhibited the greatest number of canid paraphernalia from any singular context, suggesting that the wolf was particularly important to the symbolism associated with this offering.

The remains of six puma and one unidentified felid also accompanied these canid skulls. Unfortunately the very fragmentary nature of the crania, for both canids and felids, made it extremely difficult to recover complete heads. Instead bundles of mixed canid and felid remains were assigned a single Elemento number, and only later in the lab was it possible to reconstruct the MNI.

The last species identified in this offering was the roadside hawk, represented by the mandible, parts of the wing, the tail bone, and parts of the tibiotarsus bone. Just to the north of this concentration, a right carpometacarpus of an unidentified hawk specimen was also discovered, mixed in with the remains of a canid skull. The absence of species, in this case the rattlesnake and eagle, is also important considering their prominence in other offerings. Why these animals were not included is interesting given they were used both before (Entierros 2 and 6) and after (Entierro 5) this offering.

Spatial Patterning

Unlike the very intentional division of the ritual space manifested by the faunal remains in Entierros 2 and 6, the animals deposited in Entierro 3 did not have a clear pattern. This was probably because determining male/female distinctions among the highly processed crania presents a difficulty not just for zooarchaeologists, but for the ritual practitioners that placed the prepared skeletons into the offering. One clear observable pattern is the close association the wolves had to the sacrificed individuals. Canid crania were scattered throughout the offertory chamber, but there was a particular emphasis on wolf skulls near the head of the sacrificial individuals (Figure 8.3). Felid skulls, on the other hand, were mainly placed near the feet of the sacrificial victims, corresponding to the western sector. The only

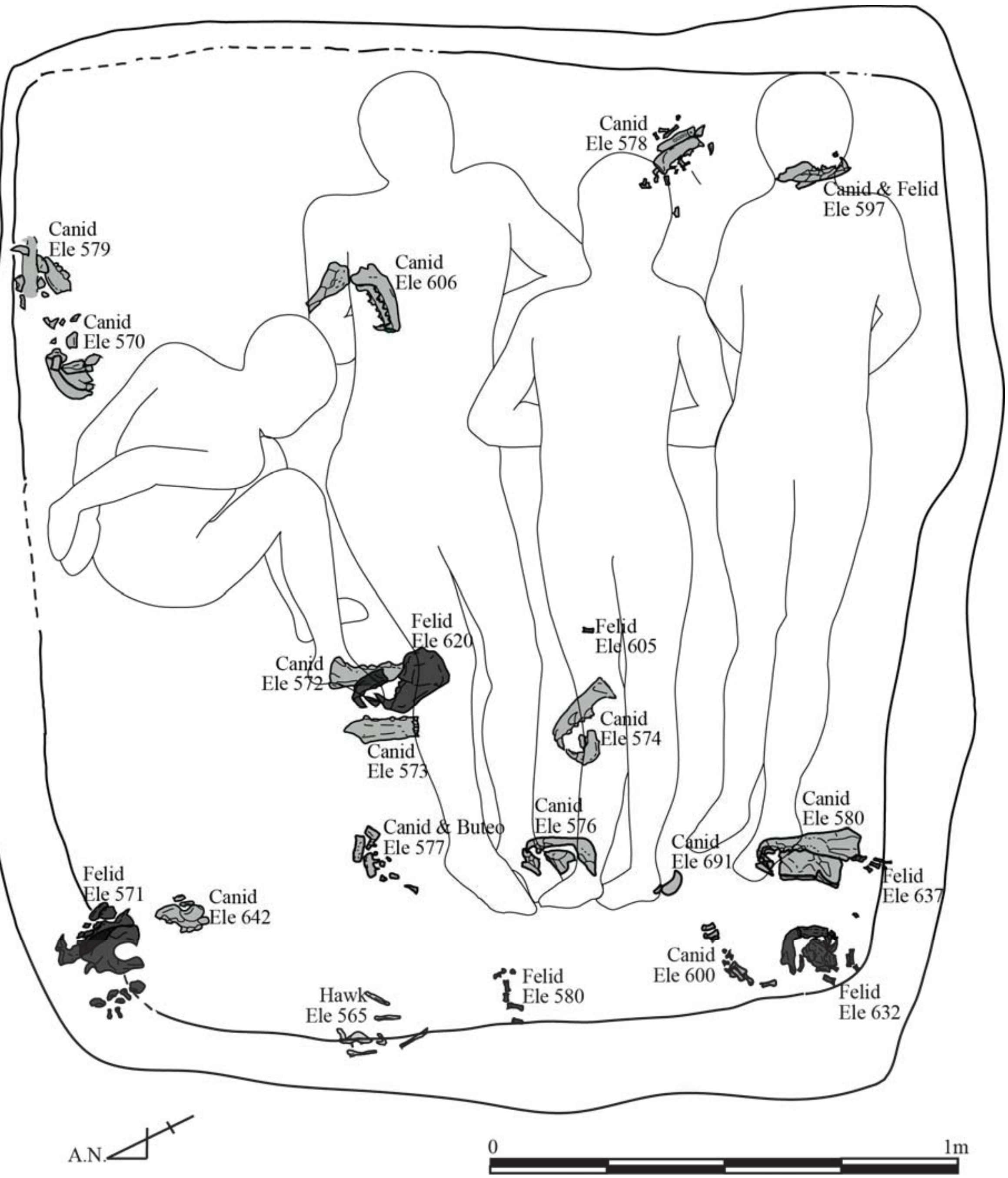


Figure 8.3 Plan view of Entierro 3 with outlines of animal bodies. Human sacrificial victim and border drawn by S. Sugiyama, animal outlines drawn by N. Sugiyama.

exception is Elemento 597.3, composed of the frontal portion of the mandible of a puma, that was found mixed with two wolf crania on the southeastern corner by the head of individual 3-A. Similarly, the remains of hawks were identified only in the western sectors by the feet of the sacrificial victims.

As explained in Chapter 3, osteological and isotopic results suggest the human sacrificial victims were war captives, all male (Spence and Pereira 2007; White, et al. 2007). This close association between warriors, sacrifice and canids are expressed by the canid maxillary pendants adorning captive warriors from the FSP (See Chapter 6) and in the canid skull assemblage found in Entierro 3. With no primary burials deposited in Entierro 3, it was impossible to recreate seasonality from the zooarchaeological remains. Thus we can only say that the ritual took place during the fifth construction phase, postdating both Entierros 2 and 6.

Moon Pyramid: Entierro 5

Unfortunately, animal remains from Entierro 5 were discovered in the poorest conditions due to the extensive taphonomical damage. This made it extremely challenging to complete any life history reconstructions due to restricted access to surface features on the zooarchaeological remains, and bad preservation that did not permit isotopic analysis on a large portion of the collection. Nonetheless, several conclusions can be made about the species diversity and spatial patterning of Entierro 5 that differ significantly from all the other contexts. Notably, there were spatial clustering among the distinct animal species (see description below) and complete animals were closely associated with the sacrificed humans.

Species Diversity

This offering contained some unique species that were not recorded in other contexts including the deer mouse — found in the serpent's stomach content— and a spider monkey forelimb. The latter was an exceptional find, as this species is non-local and its limb must have been transported from southern tropical regions. Besides some of the well-known key actors in these dedication ceremonies— wolves, pumas, jaguars, rattlesnake and eagles — other species found in this context included the crow, hawk, dove/pigeon, and frog/lizard (Table 5.1).

The majority of the faunal remains were composed of secondary deposits. The only primary burials were a puma (Elemento 1639), a canid (Elemento 1636), serpents (probably most of them were complete), and two birds: an eagle (Elemento 1638) and a crow (Elemento 1637). Distinguishing between primary and secondary deposits relied on overall representation of body parts due to the fragmentary nature of the collection.

Sixteen felid crania were discovered in this offering, all but one were represented by just crania, sometimes the claws. They included remains of mostly pumas (n=11), but jaguars heads (n=3) and other unidentified felids (either puma or jaguar) were also recorded (n=3). They were the most abundant species represented in this cache; their numbers elevated by the composite skulls that contained various teeth from multiple individuals. In comparison to the abundant felid remains, and in contrast to Entierro 3 with abundant canid skulls, there were only an MNI of two canids: a complete wolf, a head, and one claw/phalange found isolated from its head.

The second most abundant species found in this offering were the serpents scattered through the eastern sector of the dedicatory cache. These were considered primary deposits despite the fragmentary skeletal representation because some included its skull and others contained mice in its stomach.

Spatial Patterning

At first sight materials from Entierro 5, mainly due to their bad preservation, seem very haphazardly placed, with very small particles of bones scattered throughout the offertory context. However, upon completing the zooarchaeological investigation, several patterns become apparent. Most noticeable was the distribution of species. There were generally four large groupings of animals in the chamber: felids to the south, serpents to the east, canids to the north and eagle/crow to the west. While there were some isolated claws/phalanges of felids and canids in other areas, the majority were divided in these four general directions (Figure 8.4).

Three out of the four complete animal categories were associated with the three sacrificial victims found seated in the offering. Except for the abundant complete serpents distributed throughout the eastern sector of the cache, the complete animals sacrificed in the chamber were found either in front of or right next to the sacrificial victim.

The northern-most sacrificial victim was seated right next to a complete wolf, as if this wolf was accompanying its master. The victim also held the head of another wolf in its hands, confirming this

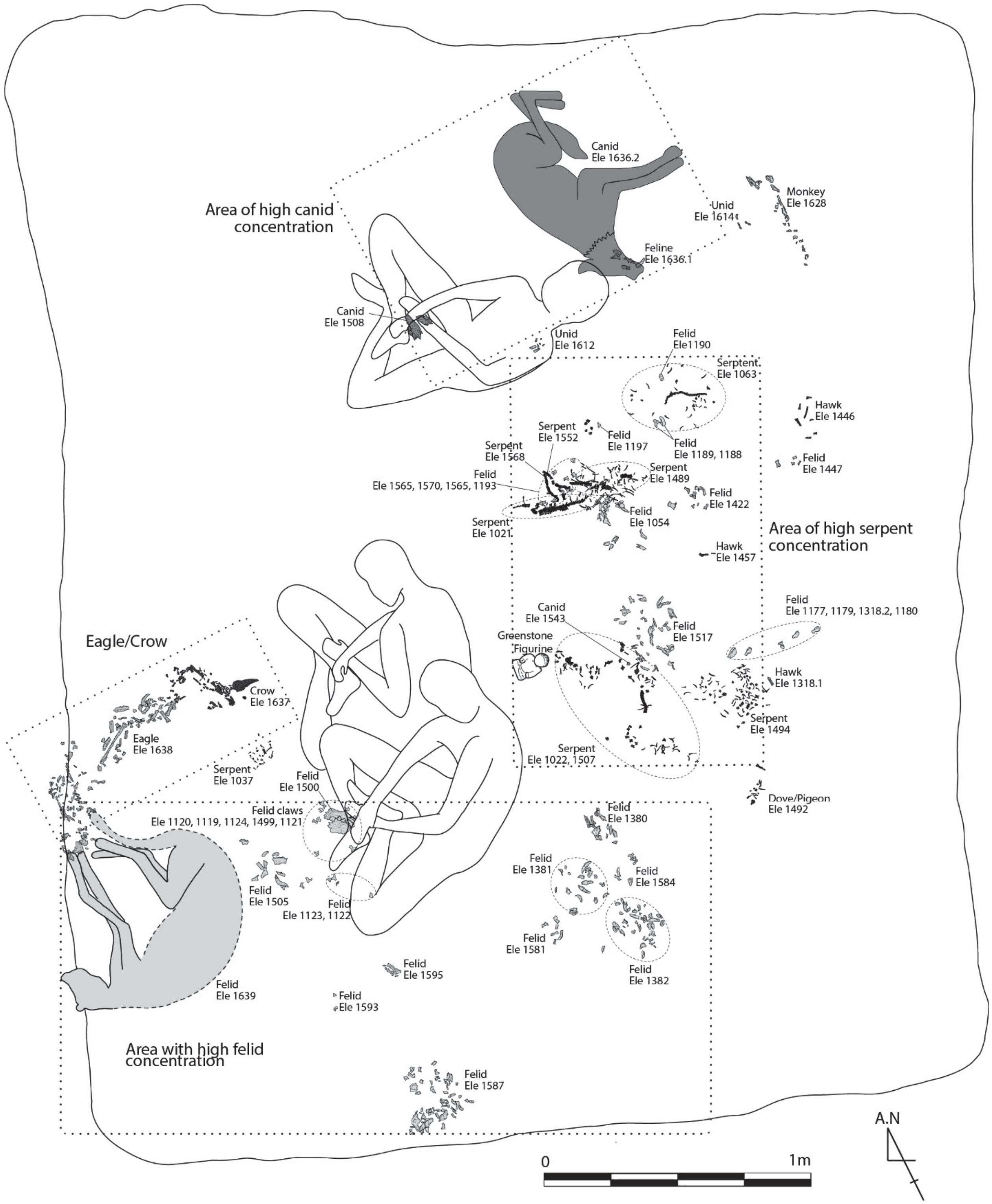


Figure 8.4 Plan view of Entierro 5 with outlines of animal bodies. Drawing N. Sugiyama.

strong bond between the wolf and this human. Similarly, a complete puma was deposited on its side with its extremities bound to the west of the southernmost victim. Many felid crania surround this victim, including one puma head that was placed in its hands almost identical to the case with the canid skull. In front of the third human, two bird skeletons were placed immediately in front (north side); an eagle and a crow. Both of these birds were very fragmentary, and thus difficult to determine with confidence if they were primary or secondary deposits. They both contained bones distributed throughout the skeleton; indicating it was probably a complete animal. There was an apparent association between the two birds and the sacrificed individual facing them. As a pair, the crow and the eagle would have represented yet another type of duality, as the eagle carries strong associations with the sun (Aguilera 1985:63-64) and the crow is thought to reflect darkness or the night sky.

Since all the sacrificial victims were deposited in a seated position facing west, they would have had their back turned to the heap of rattlesnakes placed behind them. The one exception is the presence of a rattlesnake, Elemento 1037, located in front of the two southern sacrificial victims. This individual was surrounded by a heap of broken ceramics, and was probably placed inside of this ceramic bowl; suggesting parallels to the serpents found in a basket in Entierro 6. Other mammalian and avian species from non-general fill materials were found in the eastern sector of the dedicatory cache. They included one spider monkey, three hawks, and three dove/pigeons.

Seasonality

The presence of a juvenile wolf, between six to nine months old, provides a possible clue as to when the dedication ceremony took place. As explained in the case of Entierro 2, relying on the age designation of a single wolf is risky because they are capable of breeding year round depending on the availability of resources. Particularly in cases where animal management and captivity were practiced, there is no guarantee these animals were following natural birth cycles. Nonetheless, if we assume this wolf was born in the spring, between February and April during the usual breeding season, the ritual probably took place sometime between August and January, during the dry season.

Sun Pyramid: Ofrenda 2

The faunal materials deposited in Ofrenda 2 only included seven individuals in comparison to the other offerings from the Moon Pyramid that ranged between 27 to around 75 animals from each context.

This apparent de-emphasis on fauna was probably due to not just the relatively smaller size of the dedicatory cache itself, but also because the Sun Pyramid had a distinct function that concentrated on non-faunal materials. Despite this smaller sample size, the investigation of faunal remains from this context still provides exceptional information concerning the role of animals in dedication rituals at the Sun Pyramid and how they were similar to or differed from those found in the Moon Pyramid. In particular, given the relatively close date of Ofrenda 2's construction (A.D. 240±70) to that of Entierros 2 and 6, it is no surprise to find some similarities between these contexts.

Species Diversity

Familiar species were represented in this offering including the eagle, the red-tailed hawk, the Mexican grey wolf, the puma and the cottontail (Table 5.1). Only the eagle and the dismembered remains of the cottontail found in its stomach content would have been primary burials; all the other specimens demonstrated evidence of extensive preparation. While the MNI of the puma is two in this offering, there was only one puma that was composed of a semi-complete head with its phalanges and claws. The second felid consisted of only two isolated incisors (right mandibular I2 and I3) that were found near the skull of the puma. There were also two cottontails deposited in the chamber, both juvenile/infant that were consumed by the complete eagle.

Spatial Patterning

Interestingly, the spatial patterning of Ofrenda 2 is quite distinct from the Moon Pyramid where the animals were often aligned along axial and inter-cardinal locations to orient the ritual space. At the Sun Pyramid, we see the presence of animals on the southeast (eagle), southwest (wolf) and northwest (puma) corners, but no animal on the northeast corner (Figure 8.5). Instead, a red-tailed hawk was placed in the northwest sector next to the puma. The left forelimb of this raptor were found separated from the main concentration of this individual. It is likely that the animal was no longer completely articulated at the time of burial; a pattern that was probably also true for the puma phalanges and claws that were found disarticulated and jumbled in three separate concentrations. The absence of animals on the northeast corner is mysterious; almost as if there was a specie missing to complete the picture. It is hard to make

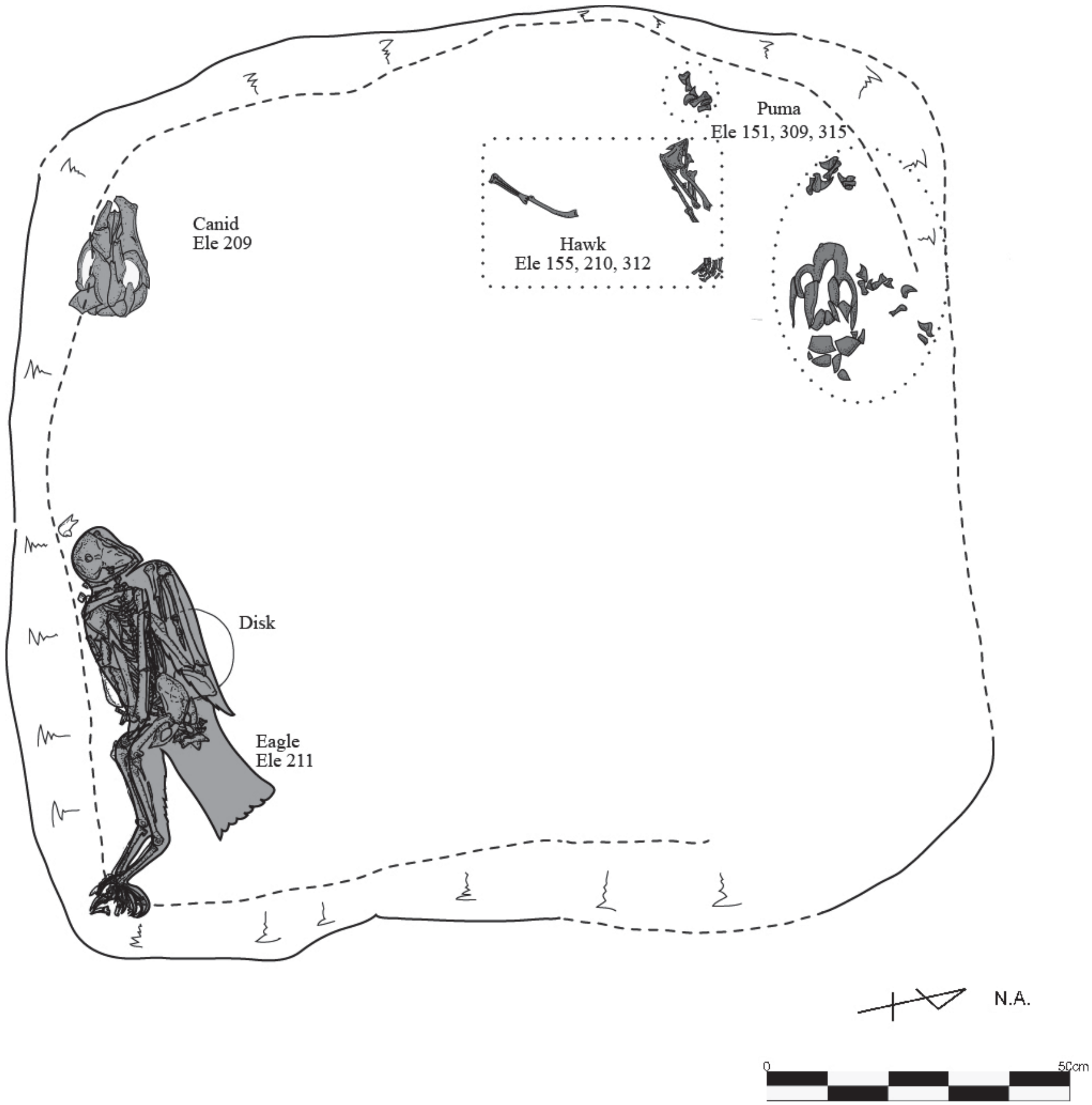


Figure 8.5 Plan view of Ofrenda 2 in the Sun Pyramid. Drawing N. Sugiyama.

any assessment of the meaning behind this, but here I only note the absence of any serpent remains in this offering chamber when such remains were found fairly consistently in the Moon Pyramid.

The primary burial of the eagle had several artifacts in its vicinity, including a small pyrite disk with a slate backing placed on the lower back of the raptor. Pyrite disks worn by sacrificial victims in the FSP have been interpreted as *tezcacuitlapilli*, a Postclassic Nahuatl term for back mirrors warn by soldiers (Sugiyama 2005:159). Mirrors have multiple meanings as demonstrated by Taube (1992), including an association to the sun (Carlson 1981:125). The slate backed pyrite disk warn by the eagle links this raptor to both militarism (warriors) and solar symbolism, very appropriate in the present context of the Sun Pyramid. Unlike the Moon Pyramid there were no human skeletal remains in the offering; instead this eagle warrior was sacrificed.

The small number of animals made it difficult to look for any additional patterns in the faunal assemblage. However, here I mention that even though only two individuals could be sexed, they did follow the general orientation that was discussed with the fauna in Entierros 2 and 6. In this offering, a complete male eagle is found in the eastern sector (or south) and a female puma skull was found to the west (or north) of the chamber. Unfortunately the sex of the wolf, because of its young age, could not be determined. Similarly, it was not possible to sex the red-tailed hawk. Despite the small sample size, the precedence of spatially segregating a divide between the sexed individuals from Entierros 2 and 6 make the pattern in Ofrenda 2 significant, as it continues to demonstrate that the sex of the organism played a central role in its deposition. Unfortunately, the only primary burial deposited in this offering was an adult eagle that did not admit a seasonal designation.

The Ritualization Process

Results presented in the previous chapters demonstrate the merit of a two-pronged approach to reconstructing life histories of the animals. The premier example of this approach is a female puma skeleton deposited in Entierro 6, Elemento 1818. Examining this individual's isotopic values of both its teeth and bone, it is possible to determine that the animal was already consuming high levels of C4 based diet (64%) a little after eight months of age and continued to subsist on a C4 heavy diet (79%) until it was sacrificed during the 4th construction phase of the Moon Pyramid. The animal was probably captured as a cub, fed abnormally high percent of C4 based diet soon after its capture. The C4 dietary input most likely originated from its protein source as indicated by the abnormally enriched $\delta^{15}N$ values (11.8 ‰) more than one trophic level higher than that of the lowest felid $\delta^{15}N$ values (6 ‰). Right before being sacrificed, this felid consumed two rabbits, one of which was cooked, and an unidentified avian specimen. Both of these rabbits exhibted $\delta^{13}C_{apatite}$ (-5.5, -5.3 ‰) and $\delta^{13}C_{collagen}$ (-15.3, -15.0 ‰) values that demonstrated heavy reliance on C4 based diet, which explained the high degree of C4 input into the felid's isotopic composition. This felid was probably consuming meats that were raised on C4 based diets like these rabbits throughout its infancy and adolescence.

During its capture or its residency within the city confines the animal was injured in two locations; its left femoral head was dislodged making the animal limp and it experienced a blow to the back of the head. Felids are not amiable to domestication due to its solitary behavior requiring large home ranges and aggressive social patterns. No doubt this animal was highly stressed in such an artificial environment, probably caged in wooden cages similar to those excavated in Entierro 2. The stress of confinement led to abnormal gnawing behavior that resulted in incredibly worn incisors. At around 18 months of age such felids would soon no longer tolerate other felids in the vicinity. The light black spots found on puma's pelt would have disappeared by this age and the shiny golden coat characteristic of adult pumas and relatively large body size would be established. It is at this age that the animal would have looked like an adult but would have become increasingly dangerous to maintain. The puma was brought to the ritual spectacle during the dry season where it was deposited on the western sector of Entierro 6 with its extremities tied.

While a similarly thick description is possible for many of the primary burials exhibiting unique skeletal pathologies indicating other injuries, infectious diseases, nutritional stress and preparation marks, others bore no surface features that could help reconstruct their life histories. Primary deposits were indeed more likely to have elevated C4 input due to being in an artificial environment that corresponded to the higher incidence of skeletal pathologies among primary deposits. Yet it also demonstrated that the carnivore population was still very heterogeneous, with different degrees of human contact being practiced among both primary and secondary deposits. In some cases, especially among the eagles, many of the secondary deposits were confirmed to have a similarly elevated C4 based diet just like the primary burials that was supported by the diverse pathological indicators found among both types of deposition.

A male eagle deposited in Entierro 6, Elmeento 2246, also exhibited a complex life history comparable to primary deposits, undergoing both extensive period of contact with human groups and elaborate preparation processes. This animal was most likely caught as a chick to be brought into the city, where it was tethered by its feet for a duration sufficient to allow an infection to develop on both inner thighs. This raptor also suffered a minor pathology on its left humerus that would have affected the humeral-ulnar joint causing remodeling in this area. The eagle was most likely raised in Teotihuacan on a mixed C3/C4 diet (59% C4 diet) as indicated by the $\delta^{13}C_{apatite}$ (-5.9 ‰) and $\delta^{13}C_{collagen}$ (-13.1 ‰) values. It enjoyed a carnivorous diet ($\delta^{15}N$ 8.1 ‰) a trophic level higher than the average Leporid values ($\delta^{15}N$ 5.2 ‰). This suggests that this eagle mainly consumed corn-fed prey, probably rabbits bred in the city, as a staple during its captivity.

The cause of death of the animal is uncertain, but Elemento 2246 did not arrive to the sacrificial scene alive as indicated by the various surface modifications. Once the animal had deceased, an opening was made on the neurocranium to remove the encephalic mass. Light cutmarks along a couple of long bones confirm that other soft tissue could have been removed. Perforation on the furculum suggests that the animal was prepared to retain skeletal integrity; a hypothesis that is supported by the relatively intact and complete body found during excavations. Fibers on the bones suggest that this animal may have been wrapped.

Based on these life histories the ritualization process for both primary and secondary burials is defined by four stages: acquisition, management, preparation, and sacrifice and/or deposition (Figure 8.6). The diagram outlines each of these stages and the archaeological correlates beginning with the wild animal that is either captured alive or killed. This model begins with the wild animal, despite the high frequency of infant and young animals sacrificed, because there is still no direct evidence of active breeding of these wild carnivores at the site. However, it is apparent that when animals were caught to be kept in confinement juveniles and infants were favored probably because they are both less dangerous and easier to tame than adult carnivores. The isotopic data with enriched $\delta^{13}C$ values on teeth and bone also support this hypothesis.

The animal was captured alive, or was brought back postmortem. In the latter case, it could be hunted and killed on the spot or may have been acquired secondarily, after the flesh and other soft tissue

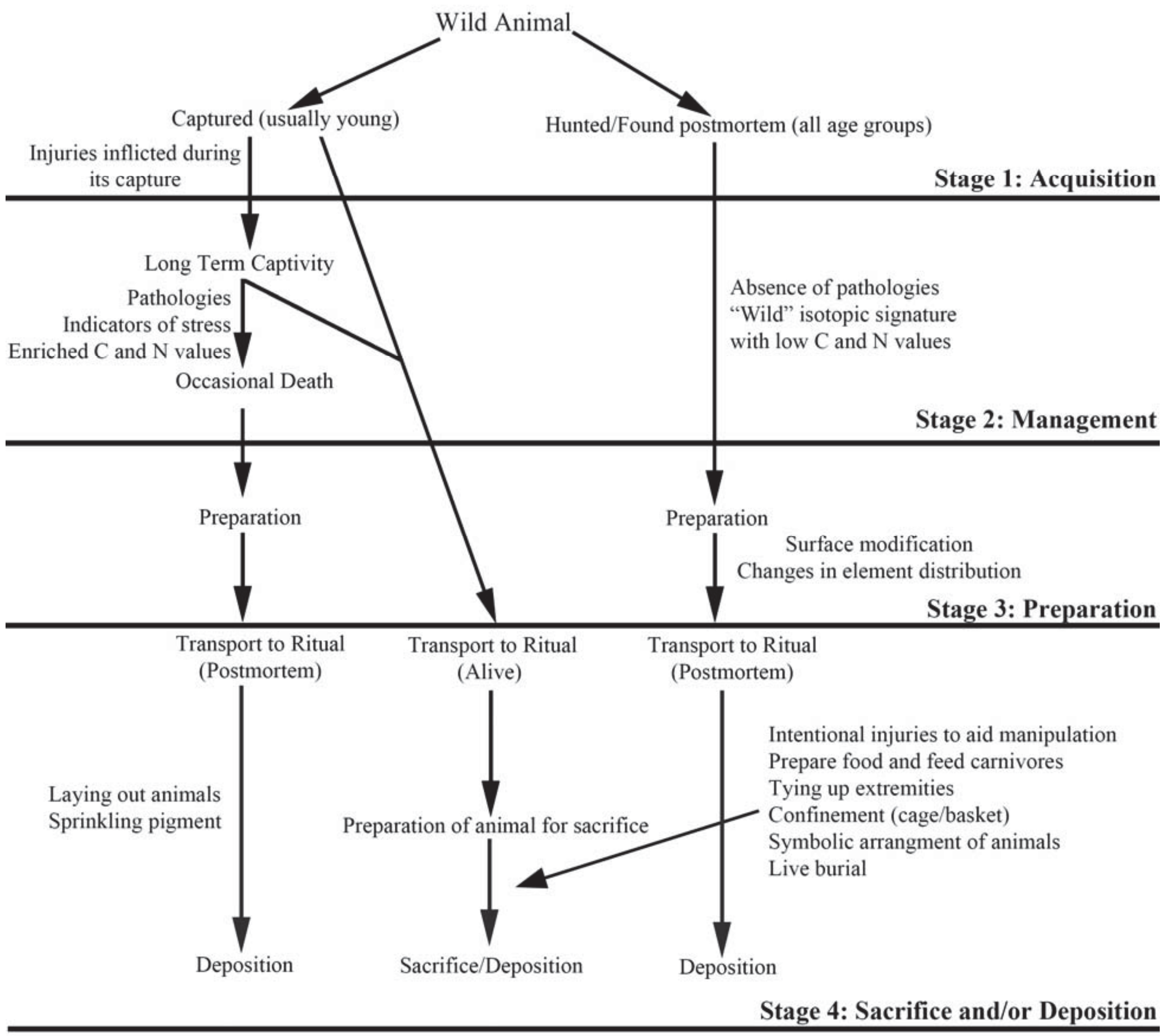


Figure 8.6 Model of the ritualization process, beginning with the live animal until its deposition into the offering in four stages.

had already deteriorated. Most likely, young carnivores were favored for capture to facilitate manipulation and transport back to the city. On the other hand, more diverse age groups were represented among prepared deposits. Some injuries may have been inflicted during capture, such as a blow to the head and/or extremities that can be identified in the zooarchaeological record.

The wild animal may have been seized immediately prior to its deposition — in which case no pathological or dietary indicators would be discernable — or in anticipation of the ritual. This latter scenario would arise if there were large predetermined number of animals that must be sacrificed at once, but that must necessarily be gathered over a long period of time. Such a planning period would require long term captivity of the animals that would result in skeletal pathologies, indication of stress, and a change in diet as reflected by enriched $\delta^{13}C$ and $\delta^{15}N$ values.

Sometimes these animals reserved for ritual sacrifice may have died before the date of the ritual; in which case they were quickly prepared to preserve skeletal integrity and to prevent decomposition. This pattern was particularly prevalent among the eagles, a species that exhibited secondary deposits with indications of captivity alongside surface modifications and changes in element distribution that marked explicit postmortem manipulation. Hunted animals would also undergo preparatory procedures that extracted the soft tissue from the brain case and removed the pelt, feathers and other secondary products. Cutmarks, perforations and changes in the body representation were found among these ritual paraphernalia. On the other hand, the lack of such modifications along with evidence of abnormal weathering patterns may be an indication that animal bones were gathered post-decomposition to be modified into faunal artifacts.

In the final stage of the reconstruction, animals would enter the ritual scene either alive (to be sacrificed) or postmortem. Various preparatory steps were taken at this point including other intentional injuries to aid manipulation and transport (usually to animals not tamed already), preparation and feeding of rabbits to some of the sacrificial victims, tying up extremities or deposited in confinement (mammals in cages, rattlesnake in basket), arranging animals into a symbolic configuration, and live burial. If the animal was a secondary deposit, they were also placed in a symbolic layout and sometimes would have been sprinkled with red pigment.

This reconstruction of the ritualized process highlights the material traces of human-animal encounters including initial contact, physical interaction while the animal was alive, as well as the long term planning, management and preparation that went into each deposit. It also highlights the complexity in coordinating the ritual spectacle. This preparation process included species election, what the appropriate number of each species should be, what animals should be fed prior to their sacrifice, and even the sex of the animals chosen to participate in the ritual. All of these factors were dictated by their cosmological significance and the meanings attributed to each of the dedicatory rituals. For Entierros 2 and 6 that demonstrate a well-coordinated assemblage, this process would have required long-term planning of both offerings in unison even though they would have taken place at separate moments of time. Thus this long process whereby the animal is transformed from a wild carnivore into a sacrificial victim or ritual object must be considered when interpreting the role of animals in dedicatory caches.

CHAPTER 9

Animals that Reside in the Sacred Mountain: The Meaning of Animals

This dissertation reconstructed the ritualized performance through detailed animal biographies. Both sacrificial victims and faunal ritual objects established complex relationships with Teotihuacan's inhabitants as they were seen, heard and experienced in confinement, as well as during the dedicatory act itself. I have introduced animals as active agents — living, sentient beings — that interacted with humans through various means during the ritualized performance. Now that we understand the ritualization process, it is time to question the underlying meanings attached to this group of animals and how these animals directly contributed to defining the sociopolitical landscape. In the following section I begin by arguing that these animals were converted into key symbols. These animals were established within the ethnozoological classification systems at Teotihuacan as highly restricted and empowered animals analogous to the Teotihuacan state.

Animals participated in the dedicatory act in two forms: as live sacrificial victims and as ritual paraphernalia. Summarizing some of the findings, I examine what the differences in these two presentations signaled and how the Teotihuacanos emphasized different forms through time. Subsequently I focus on the fourth construction phase to argue that dedication rituals of Entierros 2 and 6 were the processes by which carnivores were transformation into key symbols for the first time. This is why many of these animals were consecrated into sacrificial victims as they entered a distinct realm of human-animal encounters undocumented with wild carnivores prior to this period at Teotihuacan. The fauna arranged in Entierros 2 and 6 actively materialized the cosmogram, embedding live animals that transformed this pyramid into a sacred mountain.

Once the identities of the animals as key symbols was fixed, there was a shift in the animal distribution from the dedicatory complexes that begins with animals defining the place, orienting the ritualized context, to one in which the animals begin to reference either a group of individuals or key persons deposited in the offertory chamber. As the monument was amplified, reconstructed, and reconfigured, so was the social identities of the animals and their significance. These ritualized performances "naturalized" the sociopolitical landscape.

Animal as Symbols

Many of the fauna found in the dedicatory rituals from Teotihuacan were animals that were utilized throughout Mesoamerica in the past and continue to play a dominant role among modern indigenous communities as prominent beings (rulers, deities, warriors, shamans, etc.) associated with various natural forces (water, fertility, thunder, rain, etc.). I do not go into extensive detail on the symbolism of each of these animals (see summary in Chapter 4) because the present study concentrates on the production of key symbols and how they, as a unit, served to define the monuments in which they were embedded.

Species representation could be a good starting point to identify select animal categories (Serjeantson 2000). It is apparent that the same actors re-appear throughout the different offertory contexts and in the Teotihuacan iconography, suggesting that instead of incorporating the diversity present in the local landscape, specific species were repeatedly emphasized. These were the animals reserved for the Teotihuacan state; an affiliation that was formed and reinforced through their use in state-sponsored ritual spectacles. This was the reason why the only complete animals were these key fauna; the felid (mainly puma), the wolf, the eagle and the rattlesnake. The only exception was a raven found in Entierro 5 that was probably complete.

The Teotihuacanos chose these animals because they have long held a prominent role in native ontologies that were deeply rooted prior to the development of Teotihuacan. They were symbols with very strong ideological backing, drawing on traditional sources of power. What made the Teotihuacan case unique was that they dramatically changed their interaction with these animals in an active and intentional manner. More importantly there was an effective outlet to display and have the participants embody this new human-animal connection. These symbols stood to represent not just a metaphorical link to traditional sources of power as prominent carnivores on the landscape, but physically were manipulated, handled, most likely paraded around the city drawing a vivid and direct interaction.


Figure 9.1 Mural painting of alternating felid and canid from Atetelco, lower register, Patio Blanco, Portico 2, eastern wall. (Photograph by N. Sugiyama).

This renewed understanding of human-animal interactions at Teotihuacan requires a fresh look at the animals in the mural paintings at Teotihuacan. These large carnivores are some of the most prominent figures in Teotihuacan iconography. At the Atetelco apartment compound a felid and canid alternate marching in procession along the lower walls devouring a tri-lobed heart, directly alluding to the practice of heart sacrifice (Figure 9.1). These murals depicted animals that were physically present in the city confines. Their carnivorous gestures depicted in these scenes would have been vividly heard and experienced by the residents of Teotihuacan, reinforcing the very same properties of the beast that made them powerful icons in the first place.

Below, I explain how these animals were converted into key symbols during the construction of the fourth building episode. It is through the ritualized performative acts as sacrificial victims and as ritual paraphernalia that these animals were experienced as active elements in the organization of the sociopolitical landscape as they took on the role as key symbols of the Teotihuacan state.

Once they were converted into symbols, they were embedded into the social memory of the participants, continuously affirmed through its repetitive use and representation. This is why the very same species keep re-appearing throughout the Teotihuacan occupation, both in the subsequent dedicatory offerings, but also in the Teotihuacan iconographic repertoire. Even after the completion of Building 4 and the two dedicatory caches, these animals continued to be affiliated with state rituals in the construction of Buildings 5 and 6 of the Moon Pyramid, the monumental construction of the Sun Pyramid, and even in the Feathered Serpent Pyramid. To a lesser degree, they continued to be used as sacrificial victims, but specific body parts like the head and wings were incorporated into the ritual scene referencing the connection of these animals to the state. In the apartment compounds these carnivores continued to be drawn as active beings marching in procession, hunting, and conducting sacral acts like sacrifices (felids devouring heart, coyote/wolf with sacrificial knife, etc.). No doubt the pelts and feathers extracted from these carnivores were also utilized as they would have adorned rulers, warriors and other religious and political personnel.

The above analyses demonstrated several key aspect that define felids, canids, eagles and rattlesnake as key symbols of Teotihuacan: they were drawing on traditional sources of power, they were visually recognized and emphasized with a clear connection to the institution, they deliberately constructed a world order that was linked to the state, and once they were defined as key symbols, they were continuously maintained and affirmed as such (Chapter 2). The Teotihuacan case examined how animals were constructed as state symbols via establishing physical relationships with these animals through captivity and through their participation in state rituals. Now I discuss the details of the two forms in which animals participated in the ritual spectacle: as sacrificial victims and ritual paraphernalia.

Constructing the Sacrificial Victim

I argue that one of the key processes that defined animals as key symbols of the Teotihuacan state was through constructing these animals as sacrificial victims. In Chapter 2, I utilized an example of Aztec human sacrifices during the Toxcatl festival to outline the processes by which a human victim was set apart, transformed into the deity Tezcatlipoca for a year before the grand slaughter (Carrasco 1991a; López Austin 1988:376-377). Sacrifice was defined as the process by which an anonymous human/animal undergoes a hierophany, given agency, purpose, identity and metaphysical standing, consecrated into the ultimate sacrificial victim. I believe this process was not specific to human sacrifices and several archaeological and ethnographic case studies demonstrate parallels in the ways the identity of animal victims were similarly constructed.

As McKusick (2001) rightfully points out, there is a distinction between birds of ritual, ceremony and sacrifice, whereby everything is deliberate about birds of sacrifice among modern native communities living in southwestern United States. Nothing is based on opportunistic procurement with specific rules and regulations governing each action including how families have designated zones where they can go catch these eagles (Fewkes 1900), how caught eaglets must be carried by specific baskets or miniature cradle boards, how boys must hunt and feed these eaglets, and how special miniature blankets are woven for their burial in a appointed eagle cemetery (McKusick 2001). These eagles usually meet their fate around the same age right around the Spring equinox the year after they are born during their prime plumage. This ethnographic description has been utilized to interpret the large assemblage of avian cages that housed turkeys and macaws at the ceremonial center of Paquimé, Casas Grandes (Di Peso, et al. 1974; McKusick 2001). This case study highlights a key point of distinguishing sacrificial animals as a distinct category caught and kept in confinement specifically for sacrifice while other birds of the same species would have been kept for other ritual purposes through general opportunistic procurement.

Not all animals can be lumped into the same category. Losey, et al. (2011) argues that even within a category of animals, each animal was not "ensouled" because not all animals established a relationship with humans. Similarly, some jaguars were master guardian spirits, more powerful and dangerous, while others were within a general category of jaguars. Reconstructing the social life of animals distinguishes those that parallel human lives, define those individual animals that were most intimately involved with humans. This is reflected in the treatment of the body at death that can distinguish animal souls that just cycle back into a collective for that species, like the bones returned to a hunting shrine (Brown 2005), and others that retain individuality or uniqueness even after death, as in the case of dog and wolf deposits from Cis-Baikal, Siberia that accompanied human burials, treated similar to human bodies (Losey, et al. 2011).

A case study of bear ceremonies conducted by the Ainu provide another point of reference. This ceremony, whereby Ainu communities bring a cub into the village to be raised there for a year prior to killing the cub, has been argued to be either a replication of the perfect "hunt" (Smith 1980) or a visit-and-return of the *kamuy* spirit (Kimura 1999; Kitagawa 1961). My interest in this ritual lies not in its definition of this ritual as a hunt, gift or sacrifice, but in the processes by which an individual bear is isolated from the forest, identifying it as the animal form of the *kamuy* spirit that is developed during its confinement, offerings are made to the animal, who is eventually slain, and its meat consumed (Kimura 1999). Bringing the wild animal into the community is the very means of how the animal's identity was constructed, in this case as the *kamuy* spirit, setting the bear apart from any other bear in the forest. The bodily presence of the animal where it was felt, heard, fed, and seen were the means of establishing a real physical connection with this animal, transforming its identity.

A multi-methodological analysis of Inca child sacrifices found in the Andean summits provide a methodological model of how the biographies of these sacrificial victims can be reconstructed. Due to the pristine preservation of the mummified bodies, detailed archaeological, isotopic, and mtDNA analyses backed by the thick colonial and ethnographic descriptions of Inca ritual practice provided the basis for a full reconstruction of the life histories of four sacrificial children (Wilson, et al. 2007). The diet of these victims, analyzed by shifts in carbon and nitrogen isotopes of hair indicated that some of their diets shifted considerably (more C_4 foodstuffs and increased meat consumption) circa one year prior to their sacrifice (Wilson, et al. 2007). Hydrogen and oxygen values changed before death among all the children, representing an extended journey toward the summit starting about a year before they met their fate (Wilson, et al. 2007). DNA of the hair from bags carried by the children demonstrated that their hair were cut, in one case six months prior to sacrifice, probably as a marker of a separation from a previous life phase once her duties as a victim was established and her status was elevated (Wilson, et al. 2007). They were drunk from *chicha* (maize beer) to numb their senses, ingested coca leaves and other hallucinogenic drugs (achiote, *Bixa orrellana*) (Wilson, et al. 2007). Like the Aztec Toxcatl festival, child sacrifices among the Inca also required a period of separation, change in status, identity formation, differed food habits and movement across the landscape to define and expose the selected individuals to the public as their identity as sacrificial victims were consolidated.

In the case of sacrificial animals from Teotihuacan I argue that the consecration process recorded in the zooarchaeological and isotopic record was how these carnivores became empowered symbols of the Teotihuacan state, becoming “the master of animals”. Many of these animals were “selected”, captured alive, to reside in the urban center during its youth. The daily interactions with the Teotihuacan populace completely transformed the identity of these animals and how the Teotihuacanos perceived and experienced these animals. During this period of confinement they were fed drastically altered food, based on standardized prey (rabbits) bred with C_4 foodstuff. Brought in as young, many of the animals would have spent the majority of its life in artificial environments, cohabitating with humans that took care of, fed, and prepared the animals to become ultimate sacrificial victims. This was not an easy feat, as indicated by the various injuries placed on the carnivores that probably facilitated their manipulation.

Later descriptions of “Moctezuma’s Zoo” by Spanish conquistadors give us a glimpse of how the populace would have experienced the presence of wild carnivores in the city confines (Blanco, et al. 2009; Nicholson 1955). Both Hernan Cortés (1971) and Bernal Díaz de Castillo (2008) comment on the grand aviary and house of beasts that both brought awe and great fear to the Spanish soldiers as the loud infernal noises of the hisses and roars could be heard throughout the night. The ability to gather, manipulate and sustain such a large populace of exotic and ferocious fauna was an exceptional undertaking that required a tremendous expenditure: extensive biological knowledge of the habits of these creatures, knowing how to capture them, what to feed them, and how to handle them. It is unlikely that they had such an extensive program at Teotihuacan like the active breeding populations as described by the colonial documents. However, it is evident that by this time they had sustained at least a subset of the sacrificed animals from the dedicatory cache over a millennium prior to the Spanish conquest.

It is highly probable that these captive carnivores were also proudly displayed maybe even paraded around public events similar to how deity impersonators of the Toxcatl festival and Inca sacrificial children traveled to different centers. The movement of the key animals, just like the deity impersonator's visit to other neighboring centers would have created a "metamorphic vision of place" transforming these locations to a ritualized landscape (Carrasco 1991a:33). The graphic depictions of the very same ferocious carnivores in the apartment compounds, usually depicted in procession around the walls may allude to visual memories of the presence of these very same carnivores during such events. Certainly knowing that the animals were probably living within the city confines brings new awareness to the animal iconography that cannot merely be understood as a metaphorical symbol of the animal, but that it incorporated active depictions of animals viewed, heard and experienced in the daily lives of the inhabitants that served as mnemonic devices.

By the time these sacrificial animals marched into the ritual scene, either in cages or carried with its extremities bound, they participated in the ritual spectacle not as natural animals on the landscape, but as ontological agents that were the "master of animals". Their body presence in the ritual was the result of an ongoing process of setting these animals apart as active beings. As empowered animals, they were buried alive to eternally reside in the mound as the master guardian animals of Teotihuacan.

Constructing Animal Bodies

This dissertation also investigated how animal paraphernalia were produced. From this reconstruction, animal products were interpreted as complex, entangled objects that served as referents to the power of the animal category itself and as mnemonic devices alluding to the identities of the sacrificial victims that ley beside these faunal objects. Even after death, animal bodies remain salient, whereby personal and reciprocal interactions between humans and animals continue as faunal bodies are retained, curated, modified and utilized (Hill 2011; 2013). Use of animals that were empowered symbols of restricted species, like the carnivores examined, defined the cultured landscape. They served to create the social identities of the human sacrificial victims and to orient the ritual scene.

Many incomplete animal skeletal elements were placed in dedicatory caches along with complete animals that were sacrificed, as well as with other human sacrificial victims at Teotihuacan. Interpreting animal body parts deposited secondarily into the caches, often times after extensive manipulation of the animal product (de-fleshing, extraction of feathers and skins, etc.), could help interpret some of the underlying significance of the animal taxa in question. Certainly animal products participated in dedicatory rituals as they were used by the practitioners as ritual paraphernalia and costumes.

Analyzing the material correlates of animal products, we find that certain species and specific elements were more important than others. For example, different taxa were placed differentially into the native classification system. Similarly, different body parts had varying significance, some parts containing vital organs that were thought to contain nuclear life forces (López Austin 1988). Indeed, in the case of human bodies, it has been argued that, "the decoration, movement and changes of the human body and its most potent parts, including the head, heart, hair and blood, constituted a significant portion of the nexus of ceremonial life" (Carrasco 1991a:37). Because the ancient Nahua believed that vital forces, even part of the supernatural force of human-gods, resided in the bones (López Austin 1973:124; 1997:205), looking at the zooarchaeological assemblage is valuable. There was special emphasis placed on elements that stimulate the senses including sight, hearing, smell and taste, that are all mitigated through the head (McNiven 2010). For example McNiven (2010) provides ample evidence for a concentration of dugong ear bones in archaeological deposits at Torres Strait, Australia. Meskell (2008) also examines the emphasis on headedness or headlessness, as she documents the removal and circulation of heads in both human and animal mediums through osteological, zooarchaeological and figurine assemblages at Çatalhöyük (Meskell 2008). At this site skulls of bulls, vultures, goat, and wild boar jaws were found attached to walls after 're-fleshing' them with wall plaster (Meskell 2008:377).

Similarly, canid and felid heads at Teotihuacan were prepared usually soon after the animal was killed, extracting its pelt and other soft organs to be deposited bare (Chapter 6). Generally speaking there were two patterns in mammalian head preparations techniques; some that attempted to retain the shape of the complete head intact while others only emphasized the snout. In the case of felid crania from Entierro 5, the possibility of composite figures was presented. The presence of hybrid beings such as the jaguar-serpent-bird (Kubler 1972) in the mural paintings from Teotihuacan demonstrate the fluidity in which animal body parts were combined.

In the case of birds, they were praised for their elaborate feathers and its capacity for flight. Eagle secondary deposits attempted to retain the overall form of the entire body, many times keeping the extremities intact. For some eagles the possibility of taxidermic preparation was proposed, and even other incomplete deposits were argued to have been kept in captivity. The Teotihuacanos would have developed a similar intimate knowledge about the animal, including its sex. This was supported by the abundant pathological indicators and isotopic results that could not distinguish between primary and secondary eagles that were laid out in accordance to their sex (Chapter 8).

The assemblage from Teotihuacan not only alludes to how animal bones were prepared for deposition, but also provide some of the only material traces of the processes of pelt extraction. Felid and canid pelts as well as bird feathers were utilized throughout Mesoamerica as headdresses, costumes, warrior regalia, thrones and other ritual paraphernalia. In the mural paintings of Teotihuacan, we see individuals holding canid fur bags, elaborate feathered headdresses, and canids and avian anthropomorphic figures dressed in military regalia (Berrin 1988; Fuente 2006a; Miller 1973). These products were probably extracted from the same animals that were deposited into the dedicatory caches, carefully scarping along the areas where the bone is closest to the skin that left the cut marks recorded in the present study.

The careful analysis of ritual paraphernalia also demonstrated that unlike the primary deposits where each animal was carefully procured establishing tight interpersonal connections, sometimes the secondary deposits were acquired opportunistically. Not all the elements had evidence of pelt extraction and preparation methods varied in many cases. It is possible, particularly for Entierros 3 and 5, that animal products were acquired secondarily post decomposition and weathering. Unfortunately due to the differences in preservation between the various contexts, many features that looked like weathering processes could not be confirmed. This procurement process does, however follow expectations set by McKusick (2001:1-4) for birds of ceremony and ritual in southwestern United States that were acquired opportunistically like road kills or through hunting while conducting other chores.

The animals deposited as ritual paraphernalia included other species not recorded among primary deposits: other birds (hawks, owls, and crow), spider monkey, and other small mammals that were part of the stomach contents and fill refuse. These animals probably referenced the symbolism of that animal category, not individualized as in the case of sacrificed animals. Together, animal body parts and complete sacrificial victims participated in dedicatory rituals throughout the construction of the Moon Pyramid and Sun Pyramid.

Constructing a mountain

Above I discussed how animal identities were constructed through interpersonal interactions established throughout the ritualized production of the sacrificial victim or ritualized objects. Utilized in state spectacles, participants embodied the religious, bodily experiences through their sensory engagement as they saw, heard, felt, and embodied animal bodies (Dornan 2007). Now let us juxtapose this understanding of the animal into the offertory context to interpret how animal actors contributed to the creation of the monuments in which they were embedded. In this analysis I return to understanding pyramids as representing mountains, and in particular the function of the *altepetl*, the watery hill, in the ceremonial landscape (Chapter 2). I also interpret the dedicatory caches as the nexus for the materialization of their cosmogram and the very means by which place making occurred. In this section I examine the first expression of state monumentalism at the Moon Pyramid during the construction of Building 4 to make a case of how these animals actively defined this monument aligned with the Cerro Gordo as a sacred mountain where animals resided in its interior. Then I look at the subsequent offertory complexes to examine how the use of animals, once established as key symbols changed diachronically. I also discuss how the role of animals at the Sun Pyramid and Feathered Serpent Pyramid was slightly different that probably had to do with other functions embedded in the monument.

Moon Pyramid: Building 4

Teotihuacan ritual specialists embedded conspicuous references to their cosmogram in the earliest dedicatory caches (Entierros 2 and 6) at the Moon Pyramid during a period of a city wide monumental construction program (Chapter 3). These two caches represent the most comprehensive evidence for the active and central role animals played in state ritualized activities, with the most abundant and convincing evidence of the active construction of sacrificial victims than all the other caches combined. Entierro 2 contained 18 sacrificial victims while Entierro 6 included 33 primary deposit (counting 18 serpents in the basket which is an inconclusive count). Many of these animals were kept in confinement, as indicated by the zooarchaeological and isotopic dataset, which suggest that leading up to these two dedicatory acts, there was an expanded focus on these carnivorous beasts as these animals were captured and kept in confinement. Animals undocumented to be roaming the city confines were brought in, tended to, fed, and heard by the city inhabitants. In addition equally large amount of ritual paraphernalia constructed mainly by the very same animals were also gathered and processed to be deposited at the ritual scene. As such, it provides a unique window into examining how these animals defined the ritualized landscape.

As was described in detail in Chapter 3, Entierros 2 and 6 were placed inside the fourth building sequence, the former along the bedrock layer and the latter midway in its construction. The parallels between the two offerings has already been discussed elsewhere (López Luján and Sugiyama 2008). Key features of the zooarchaeological evidence also support that the two offertory caches were planned as a unit. In Chapter 8 the obvious parallels in the spatial patterning, concentrating on depositing the animals along axial and inter-axial lines was discussed. In particular complementary numbers are represented by the animals such as 18 eagles found in Entierro 6 while half this number, nine eagles, were deposited in Entierro 2. As a unit the spatial patterning of the animals replicated the cosmos.

Not only were the number of animals repeatedly emphasizing cosmologically significant numbers that oriented the ritual space, the sex of the animal was also significant. In Entierros 2 and 6 males were placed in the eastern sector of the chamber while females tended to be deposited to the west (Chapter 8). The distribution was much clearer in Entierro 6, and only the eagles followed this pattern in Entierro 2 because the mammals were placed along the north-south axis. In both cases it demonstrates that there was an intentional selection of the sex of the animal in accordance to its position in the cache.

The seasonality of the event also suggested that the timing in which the dedicatory acts themselves were conducted were complementary to each other. Reconstructed by age designations of the young animals, it was determined that Entierro 2 occurred during the summer to late-summer (June-August) during the wet season while Entierro 6 took place sometime during September and April, overlapping most considerably with the dry season (Chapter 8). Together Entierros 2 and 6 represented one of the most drastic events in the agricultural cycle, which was the transition between the wet and dry seasons. Examining these two factors, it is evident that the two Entierros functioned as a unit to orient the ritual space based in function of horizontal and vertical space (Figure 9.2). Along the horizontal plane, east (or right) was associated with males while females were represented to the west (or left). There was also a dual division of the upper and lower sectors of the monument, the upper (Entierro 6) emphasizing the dry, celestial sphere while the base of the monument (Entierro 2) signified wetness placed along the earth.

Complementary oppositions was a central component of Mesoamerican cosmovision that was effectively ingrained into the symbolism and layout of monumental works. For example, the Aztec Templo Mayor emphasized oppositions: the southern half was dedicated to the god of sun and warfare, Huitzilopochtli, while the northern half corresponded to the rain god Tlaloc (López Austin and López Luján 2009). At the same time, a vertical division was made between the base platform where serpents undulated in the form of large sculptures that represented the earth while upper sectors emphasized the celestial sphere (Matos Moctezuma 1986:70-71). In this case hotness, astral and dryness were represented to the south and superior zones while coldness, astral and humidness were represented in the southern and inferior aspects. Complementary values of vegetation, coldness and dryness were found in northern and superior areas, vegetation, coldness and humidity were found in the northern and inferior aspects of the Templo Mayor (López Austin and López Luján 2009:481).

Now how can we interpret the present assemblage at Teotihuacan? I turn to two key ethnographies that help understand the significance of the two directional oppositions that relate to upper/lower and east/west. The first is a spatial analysis of modern rituals conducted by the Chamula Indians conducted by Gossen (1979) and another is a study of directionality among Nahua groups

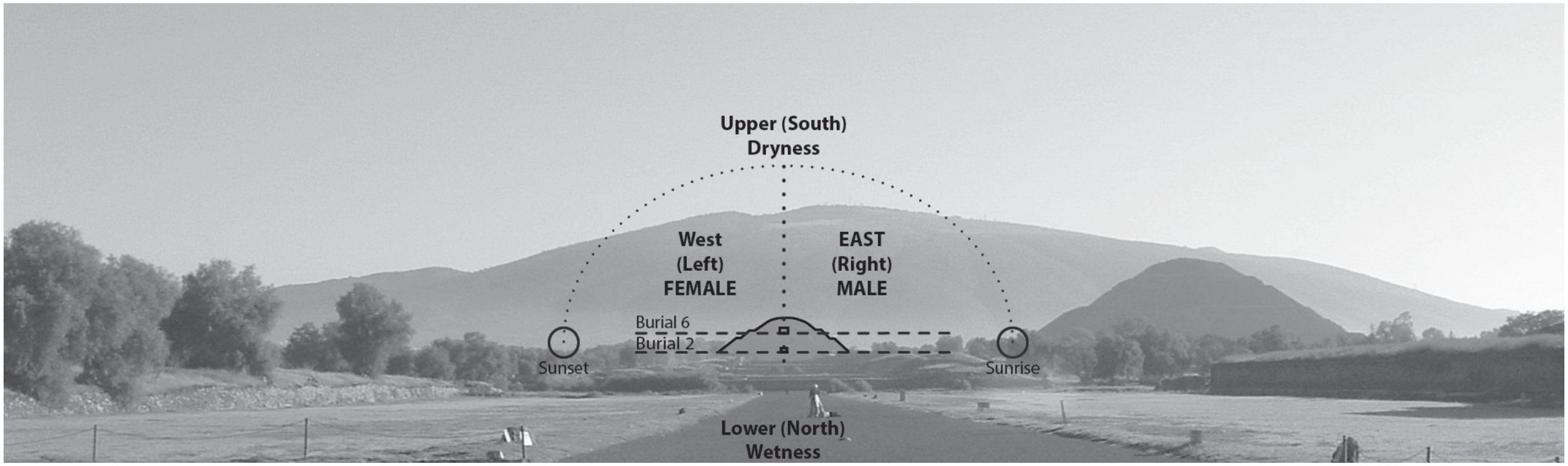


Figure 9.2 Division of horizontal and vertical space in relation to the Moon Pyramid and the location of Entierros 2 and 6, overlaid on photograph of the Moon Pyramid (Photograph taken by S. Sugiyama).

examined by López Austin (1993). Both studies demonstrate an acute focus of the sun's movement through the sky.

The obvious connection of the east (or right) to the sun and thus maleness is manifested every morning during the sunrise while the west (or left) is associated with the transition to the female moon during sunset (Gossen 1979). This relates to connection between males, celestial spheres and hotness, while females are associated with the earth, underworld, and coldness.

These directional associations are clearly manifested in various aspects of a Chamula community at the level of the household and at the church. A Chamula house, organized around a hearth, is divided between males and boys that sit and eat to the right of the hearth (facing interior from the front door) while women and girls place themselves to the left (Gossen 1979:121-122). Males would sit in tiny chairs raising them above the ground and wear sandals to separate them from the ground that complement their masculine heat. Women, on the other hand sit on the ground and walk barefoot, providing a direct link to the earth that is feminine and cold. This dichotomy is also manifested in the church, as all major male saints march right (counterclockwise) while females move left (clockwise) around the atrium (Gossen 1979:125).

The sun moves northward along the eastern horizon as the days become longer between the vernal equinox and the summer solstice that corresponds to the first rains of the wet season that beings in early May and the subsequent start of the annual growing cycle. This provide a link between north and the wet season (Gossen 1979). In contrast the sun moves southward between the autumnal equinox to the winter solstice when the days are shorter and the growing season comes to an end (Gossen 1979). Thus the south is often associated with the dry season, the underworld and night time.

Nahua beliefs similarly divide the sky in north/south and east/west. For them, the south, or above, symbolizes life because the sun runs chiefly to the south while the north, or below is associated with death and the underworld (López Austin 1993:171). At the same time, east is considered masculine and the west feminine because warriors deceased during combat reside in the eastern sky while women who died in childbirth reside in the western sky (López Austin 1993).

Maya ceramics and stelae convey similar conceptions of the left/right division. Central figures, usually superior ritual and political leaders and men were more likely to be facing right and using their right hand, exemplifying that the right was affiliated with masculinity, power and sacred (Palka 2002). On the other hand, left was consistently alluded to femininity, subordination and the profane. In this manner, left/right (west/east) and upper/lower (south/north) symbolism governed where people stand, which way they face, how individuals moved within a space, and the daily actions of the individuals.

In the case of Entierros 2 and 6, these rules and regulations that oriented the ritual scene were most vividly expressed through animal mediums. Unlike the human sacrificial victims that were either scarce (Entierro 2) or lumped in a heap on the northwest corner (Entierro 6), the animals were carefully laid out dividing the space. In this manner males were placed to the east (right), emphasizing the direct connection to masculine, solar, celestial and warfare symbolism. On the other hand, females were positioned to the west referencing female, lunar, underworld and earth/fertility. At the same time the two dedication rituals were conducted during very different seasons, probably intentionally to represent the agricultural cycle. At the base, the dedicatory ritual for Entierro 2 was conducted in the wet season because lower (or north) represents the earth, coldness, and humidity. The upper chamber, Entierro 6, was offered during the dry season as the upper (or southern) sphere was associated with celestial, hotness and dryness. The dedicatory theatrical event, both its timing and how the animals were placed within the offering chamber, were key in performing and experiencing their cosmos that was materialized in the monument. It located the monument in vertical and horizontal space as a place on the ceremonial landscape.

Now what type of place was this? Because the sacrificial victims were the main beings that oriented the space, they hold the key in unlocking this question. In their comprehensive and thorough description, López Austin and López Lujan (2009) define several functions of the sacred mountain: as an *axis mundi*, as a point of access to the heavenly bodies, mountain of wealth, refuge for flora and fauna, home of the patron god, origin place for humans, source of power, authority and order, and as a dwelling of the dead. The mountains were the very means of controlling vital life sources (water, lightening, thunder, clouds), where ancestral spirits, patron deities and animals resided (see summary in Chapter 2). Here it is important to highlight the mountain as a place where animals, particularly the master of animals lived, to define the monument as the sacred mountain, or *altepetl*, of Teotihuacan.

In Chapter 5, examining the zooarchaeological evidence I have highlighted how the animals were probably buried alive. All the complete animals from Entierro 6 had their extremities joined, probably bound to restrict movement. Entierro 2, with its caged pumas and a wolf, provide some of the most conclusive evidence that these animals were deposited alive. This is significant because for the audience that participated in the dedicatory act, many of the animals literary "lived" in the monument, or actually resided in the sacred mountain. Their occupation within the city confines had developed deeply rooted relationships that defined their social identity as the masters of animals and key symbols of the Teotihuacan state; at the same time placing these master guardians in this monument re-oriented the ceremonial landscape defining the structure as a sacred mountain where these empowered animals resided. In essence, the identity of the animal was defined by the ritualized act, at the same time the presence of the animals in its interior defined the monument as the *altepetl* that was experienced during the performance.

Subsequent Entierros

Once the Moon Pyramid was established as the *altepetl* on the landscape, the monument persisted to be an active place as people continued to interact with the structure as it was remodeled, maintained and visited. During subsequent expansions two more dedicatory chambers incorporated animal mediums. Entierro 3 was placed during the fifth construction phase along the base, while Entierro 5 was placed when Building 6 was being constructed and Building 5 was being decommissioned (Chapter 3).

The first obvious difference in faunal use of these two caches in comparison to those of Building 4 is the immediate scarcity of complete sacrificial animals. Entierro 3 completely lacks primary burials while Entierro 5 only contained four large animals and nine serpents. Instead of the animals orienting the ritual scene, in these two cases human sacrificial victims take on the central role. Let us take a look at each of the Entirros in more detail.

In the case of Entierro 3, the four sacrificial victims fill up the offering space; thee individuals placed extended with its hands tied behind the back on the southern sector, while a fourth individual (3-D) is placed flexed, seated a little to the east of a fiber mat (Chapter 3). In this case the animals distributed throughout the dedicatory chamber do not help orient the ritual scene, rather they are haphazardly placed around the dedicatory chamber. Instead, they seem to be focused around the heads and feet of the sacrificial victims (Chapter 8), serving to signify the social identities of these humans that were probably associated with canids that symbolized warriors and militarism. The shift recorded here from the use of animals in rituals for place-making versus animals contributing to human group identity formation is noticeable.

The subsequent dedicatory chamber also has a similar pattern. With the exception of abundant rattlesnake, a wolf, a raven, an eagle and a puma were deposited complete. As discussed in Chapter 8, these individuals seem to closely be associated with the three seated humans: a wolf with the northern most individual (5-C), the combination of eagle/raven associated with the person in the middle (5-A) and a puma referencing the southern burial (5-B). Unlike the animals signaling a group of humans in Entierro 3, they seem to reference the individuals seated cross-legged in an authoritative position with its arms crossed in front. These three figures, however, have their back to the most abundant animal sacrificed: the serpents. With the exception of Elemento 1037, the other eight serpents are scattered to the east of the seated figures taking up the area most densely occupied with other rich offerings such as the conch shell, obsidian eccentric, and above all, a greenstone figurine of a seated figure that is placed right behind individuals 5-A and 5-B. These two humans almost protect the figurine, as does the animals placed in front of the humans. The abundant serpent remains are scattered around this greenstone figurine.

The meanings and functions of the animals utilized in the dedication of Entierro 5 are very complex to interpret. The animals seem to be divided into specific areas, but as a function of the layout of the human sacrifices and other offering products; not specifically to create the ceremonial space in the manner it was recorded in Entierros 2 and 6. There was a clear a shift between Entierros 2 and 6 where animals oriented the ritual space, constructing the monument as a place, versus animas that were linked to human groups (Entierro 3) or individuals (Entierro 5).

This may be why the most abundant evidence of carnivore captivity were found in Entierros 2 and 6 where this initial period of establishing key symbols was so crucial for the construction of the monument. Evidence for captivity, while present, was much scarcer in later deposits because the number of sacrificed animals was very minimal and disarticulated heads were less likely to have evidence of such manipulation. Perhaps once it was established that powerful animals reside in the monument, the state focused on establishing new forms of empowerment; this time linking humans to the place.

Even after the fourth construction phase, the offerings consistently manipulated, rebuilt and maintained their cosmogram. As was the case with Entierros 2 and 6, the location of the offering dictated what season the ceremony should take place. Unfortunately for Entierro 3 no seasonal designation could be made from the secondary deposits, but Entierro 5 most likely took place between August and January during the dry season. Placed at the summit of Building 5 during the construction of Building 6, the seasonality of the event confirms the association of the monument's superior (or south) location with dryness, astral and heat. Like Entierro 6, Entierro 5 continued to emphasize this division between the wet and dry, lower and upper.

Other monuments

Each monument was created as a particular place on the landscape, embedded within the highly multilayered landscape. Identifying how animals and animal symbols were embedded within this network help understand the roles these animals played for each of the other monuments. The dedicatory caches from the Sun Pyramid functioned differently from the Moon Pyramid. The materials from this offering were linked to the monument and the subterranean tunnel that were essential in reifying state-ideology and reformation during one of the most monumental endeavors at Teotihuacan. Ofrenda 2 is interpreted as part of the consecration ritual that initiated the construction of this pyramid, at the same time linking this monument with the subterranean feature (Sugiyama, et al. 2013a)

With only one sacrificed eagle, the Sun Pyramid did not use animals to orient the offering cache, but specifically focused on a few key animals that related to the symbolism of the Sun Pyramid. The Sun Pyramid carried a close association with felid iconography. Large supernatural felid sculptures were found in the exterior facades of the platform (Batres 1906), of which at least nine heads were counted by Barbara Fash (Fash, et al. 2009:210). The presence of these statues, as well as a felid sculpture excavated from the Xalla compound just to the north of the Sun Pyramid (Manzanilla Naim and López Luján 2001), are described as possessing a combination of celestial and terrestrial aspects with google eyes that may parallel a Maya deity referred to as the Jaguar god of the underworld (Fash, et al. 2009:209-210). These features connect the felid sculptures to the Classic Maya Fire God as argued by Stuart (1998:407-409) in Maya iconography. As Fash, et al. (2009) illustrate, this interpretation of the felid sculptures link the adosada platform to symbols of fire, sun and underworld.

It is no surprise then to find a puma skull in Ofrenda 2. Utilizing the same directional affiliation as the Moon Pyramid, the location of the puma in the northwest corner of the offering concur with associations like north (or below) and west (or left), with symbolism of female (unfortunately no sex designation of this individual), underworld, and wetness. Situated diagonally from this puma, a complete body of an eagle was placed on the southeast corner with a pyrite disc placed on its back. Interpreted as a *tezcacuitlapilli*, this back mirror worn by the eagle emphasizes its association to the east with masculinity (which this eagle was identified as male), solar symbolism, and militarism. Its southern (above) orientation also add to its link to celestial, dryness and hotness. This sole sacrificial offering, whom presents isotopic evidence of being kept in captivity, demonstrates the care in which the identity of this eagle was constructed, just like in the Moon Pyramid. The eagle played a central role, along with the three pyrite discs, to establishing this dual link between the sun/fire and underworld/water that is expressed by the Sun Pyramid and its subterranean tunnel.

Offered during the same general time frame as Entierros 2 and 6, it is no surprise to find that some of the isolated heads, like the canid and felid skulls demonstrated fairly enriched isotopic signatures that suggest the animals consumed a mixed C_3 and C_4 diet like some of the primary burials from the

Moon Pyramid. This offering must have also played a role in defining these very same species as key symbols.

The Feathered Serpent Pyramid, on the other hand, only minimally incorporated animal mediums. Instead, mass human sacrificial victims, totaling over 137 individuals animated this potent structure that engraved dominant feathered serpents undulating along the frontal façade. Many were warriors that were adorned by human and canid maxillary pendants. No animals were sacrificed alongside these humans and it seems the role of this pyramid, although constructed roughly during the same period of massive monumentalism at the ceremonial core, did not incorporate animal mediums in the same manner. It still remains to be examined if any of the canids can isotopically be identified as drawn from a captive canid population, although judging from the absence of any pathological indicators, it is likely that their isotope values would be similar to Entierro 3 that did not present any evidence of captivity.

Ritualized animals

Just like human societies, not all animals are made equal. In fact, many indigenous communities believe one species predominated over all others. For example, a pelican could be considered to preside over all other lake birds while the jaguar loomed over wild animals (López Austin 1993:158). At the same time, an individual within a species could be considered the chief or father, like a specific deer among deer, Takawiru among buzzards (Giddings 1959:68), or eagle among eagles (López Austin 1993:158). These powerful individuals are those that are closest to the Lord of the Animals (López Austin 1993:158). Animal classificatory systems order the natural landscape, which often reflects social classificatory systems that "naturalize" social differentiation as a form of speciation, giving it divine authentication (Busatta 2007; Lévi-Strauss 1966; López Austin 1993:158; McAnany 2008; Tambiah 1969).

For special individuals to embed themselves into this classification system, they must show important ties to these species that reside in the highest echelon (Busatta 2007). That is why the Pemon shamans of Southern Venezuela shout, "I am black jaguar!" (Furst 1993) and only the most powerful shaman can convert into a wolf among Huichol communities in Northwest Mexico (Valadez 1996). Such a strategy is extremely effective, so much so that despite fundamental socio-economic and ideological changes among the Maya from Classic to Colonial and Modern periods, the ideology of social difference proved to be a durable source of power (McAnany 2008). But, as McAnany rightfully argues, “authority cannot exist in a vacuum; rather it must be materialized in inherited and labor-intensive items and performed through ritual practice” (2008:220).

This is why reconstructing human-animal interactions as manifested in ritualized performances is an effective avenue for recording how social hierarchies of a scale previously unprecedented in Mesoamerica were concretized during the rise of the Teotihuacan state. State-sponsored spectacles solidified newly rising dominance over the entire social landscape with the public. Indeed, animal actors played a central role in hunting rituals, royal rites, feasts, seasonal ceremonies and dedicatory rituals around the globe (Ballinger and Stomper 2000; Brown and Emery 2008; Fiskesjö 2001; Goepfert 2012; Yuan and Flad 2005a). Teotihuacan was no exception, as animal mediums were utilized as visual indicators of human control over some of the most powerful agents on the landscape at a scale unprecedented in Mesoamerica, comparable only to later Aztec cases of animal sacrifice (Polaco 1991). Such an approach to ritual spectacles, understood as a process in the production of places within a web of interpersonal relationships with animals and animal mediums, highlights how methodologically, zooarchaeological inquiry can define human-animal encounters.

This dissertation has argued that the physical capture, management, and taming of animals, particularly of very powerful carnivores, would have dramatically altered their relationship with these beasts. Throughout the dissertation, the ritualized performance was reconstructed in excruciating detail utilizing both zooarchaeological and isotopic datasets. This study not only provided the method for how to reconstruct this relationship, but also suggests a theoretical framework from which to interpret the data within the greater context of the sociopolitical landscape. Interpreting these ritualized acts as a performance allowed a focus on various aspects of the ritual including the participants, their symbolism, and their setting (Inomata and Coben 2006). As such, a performative approach to ritual enable interpreting the dialogue of meaning and action, in this case the construction of carnivores as empowered symbols of the Teotihuacan state. This dissertation focused on a group of participants — animals — whose identities were constructed through the dedicatory acts.

Such a process would have revolutionized the social landscape, as some individuals who controlled these top predators, most likely equivalent to the master of animals, elevated themselves above these creatures. Lévi-Strauss was right, animals are chosen not because they are "good to eat", but because they are "good to think" (Lévi-Strauss 1966; see also Tambiah 1969). In the case at Teotihuacan, we must understand evidence that human manipulation over some of the animals — traditionally those regarded as powerful entities that controlled the natural landscape and the mediums through which communication to deities, spirits and ancestors occurred — would have had explicit implications to gaining a source of power previously undocumented in the area.

REFERENCES

Abe, Yoshiko, Curtis W. Marean, Peter J. Nilssen, Zelalem Assefa, and Elizabeth C. Stone

2002 The Analysis of Cutmarks on Archaeofauna: A Review and Critique of Quantification Procedures, and a New Image-Analysis GIS Approach. *American Antiquity* 67(4):1-21.

Acosta, Jorge R.

1964 *El Palacio del Quetzalpapalotl*. Instituto Nacional de Antropología e Historia, México, D.F.

Aguilera, Carmen

1985 *Flora y Fauna Mexicana: Mitología y Tradiciones*. Editorial Everest Mexicana, S.A., México, D.F.

Agurcia Fasquelle, Ricardo, and Barbara W. Fash

2005 The Evolution of Structure 10L-16, Heart of the Copán Acropolis. In *Copán: The History of an Ancient Maya Kingdom*, 1st edition, edited by E. Wyllys Andrews and William Leonard Fash, pp. 201-237. School of American Research advanced seminar series. School of American Research Press; James Currey, Santa Fe: Oxford.

Aldenderfer, Mark

1993 Ritual, Hierachy, and Change in foraging Societies. *Journal of Anthropological Archaeology* 12:1-40.

Allitt, Sharon, R. Michael Stewart, and Timothy Messner

2008 The Utility of Dog Bone (*Canis Familiaris*) in Stable Isotope Studies for Investigating the Presence of Prehistoric Maize (*Zea mays ssp*.): A Preliminary Study. *North American Archaeologist* 29(3):343-367.

Álvarez, Ticul, and Aurelio Ocaña

1991 Restos Óseos de Vertebrados Terrestres de las Ofrendas del Templo Mayor, Ciudad de México. In *La Fauna en el Templo Mayor*, edited by Oscar J. Polaco, pp. 105-148. Asociación de Amigos del Templo Mayor, Instituto Nacional de Antropología e Historia, México, D.F.

1993 *Identificación de los Restos Óseos Procedentes del Templo de Quetzalcoóatl, Teotihuacán, México*. Lab Report in Archivo Técnico de la Coordinación de Arqueología, Instituto Nacional de Arqueología e Historia, México, D.F.

Ambrose, Stanley H

1990 Preparation and Characterization of Bone and Tooth Collagen for Isotopic Analysis. *Journal of Archaeological Science* 17(4):431-451.

1991 Effects of Diet, Climate and Physiology on Nitrogen Isotope Abundances in Terrestrial Foodwebs. *Journal of Archaeological Science* 18(3):293-317.

Ambrose, Stanley H, and Lynette Norr

1993 Experimental Evidence for the Relationship of the Carbon Isotope Ratios of Whole Diet and Dietary Protein to Those of Bone Collagen and Carbonate. In *Prehistoric Human Bone:*

Archaeology at the Molecular Level, edited by Joseph B. Lambert and Gisela Grupe, pp. 1-37. Springer-Verlag, Berlin ;New York.

Ambrose, Stanley H., and Michael J. DeNiro

1986 The Isotopic Ecology of East African Mammals. *Oecologia* 69(3):395-406.

Anderson, David G.

2000 *Identity and Ecology in Arctic Siberia: The Number One Reindeer Brigade*. Oxford studies in social and cultural anthropology. Oxford University Press, Oxford ;New York.

Armstrong, Barry L., and James B. Murphy

1979 *The Natural History of Mexican Rattlesnakes*, Vol. 5. University of Kansas, Museum of Natural History, Lawrence.

Armstrong Oma, Kristin

2010 Between Trust and Domination: Social Contracts Between Humans and Animals. *World Archaeology* 42(2):175-187.

Asad, Talal

1993 The Construction of Religion as an Anthropological Category. In *Genealogies of Religion: Discipline and Reasons of Power in Christianity and Islam*, edited by Talal Asad, pp. 25-54. Johns Hopkins University Press, Baltimore.

Ashmore, Wendy, and Jeremy A. Sabloff

2002 Spatial Orders in Maya Civic Plans. *Latin American Antiquity* 13(2):201-215.

Auffenberg, W.

1963 The Fossil Snakes of Florida. *Tulane Studies in Zoology* 10:131-216.

Aveni, Anthony F., and H. Hartung

1986 *Maya City Planning and the Calendar*. Transactions of the American Philosophical Society, Vol. v. 76, pt. 7. American Philosophical Society, Philadelphia.

Ayliffe, Linda K., and Allan R. Chivas

1990 Oxygen Isotope Composition of the Bone Phosphate of Australian Kangaroos: Potential as a Paleoenvironmental Recorder. *Geochimica et Cosmochimica* 54:2603-2609.

Baker, J., and D. Brothwell

1980 *Animal Diseases in Archaeology*. Academic Press, London.

Ballinger, Diane A., and Jeffrey Stomper

2000 The Jaguars of Altar Q, Copán, Honduras: Faunal analysis, Archaeology, and Ecology. *Journal of Ethnobiology* 20(2):223-236.

Basso, Keith H.

1996 *Wisdom Sits in Places: Landscape and Language Among the Western Apache*. University of New Mexico Press, Albuquerque.

Bastien, Rémy

1947 *La Pirámide del Sol en Teotihuacan* Unpublished B.A. Thesis, Escuela Nacional de Antropología e Historia, México, D.F.

Batres, Leopoldo

1906 *Teotihuacan: Memoria que Presenta Leopoldo Batres*. Imprenta de Fidencio S. Soria, México, D.F.

Behrensmeyer, Anna K.

1978 Taphonomic and Ecologic Information from Bone Weathering. *Paleobiology* 4(2):150-162.

Bell, Catherine

1992 *Ritual Theory, Ritual Practice*. Oxford University Press, Oxford.

1997 *Ritual Perspective and Dimensions*. Oxford University Press, Oxford.

2005 Ritual [Further Considerations]. In *Encyclopedia of Religion*, 2nd ed. edition, edited by Lindsay Jones, pp. 7848-7856. Macmillan Reference USA, Detroit.

Benson, Elizabeth P.

1972 *The Cult of the Feline: A Conference in Pre-Columbian Iconography*. Dumbarton Oaks Research Library and Collections, Washington, D.C.

Bernal-Garcia, Maria Elena

1993 *Carving Mountains in a Blue/Green Bowl: Mythological Urban Planning in Mesoamerica*. Ph.D. dissertation, University of Texas at Austin, Austin. University Microfilms, Ann Arbor.

Bernal, Ignacio

1963 *Teotihuacán: Descubrimientos, Reconstrucciones*. Instituto Nacional de Antropología e Historia, México, D.F.

Berrin, Kathleen

1988 *Feathered Serpents and Flowering Trees: Reconstructing the Murals of Teotihuacan*. Fine Arts Museum of San Francisco, Seattle.

Betts, Matthew, Susan Blair, and David Black

2012 Perspectivism, Mortuary Symbolism, and Human-Shark Relationships on the Maritime Peninsula. *American Antiquity* 77(4):621-645.

Binford, Lewis Roberts

1981 *Bones: Ancient Men and Modern Myths*. Studies in archaeology. Academic Press, New York.

Bird-David, Nurit

1999 “Animism” Revisited: Personhood, Environment, and Relational Epistemology. *Current Anthropology* 40(S1):S67-S91.

Blanco, Alicia, Gilberto Pérez, Bernardo Rodríguez, Nawa Sugiyama, Fabiola Torres, and Raúl Valadez

2009 El Zoológico de Moctezuma ¿Mito o realidad? *AMMVEPE* 20(2):29-39.

Blanco Padilla, Alicia, Bernardo Rodríguez Galicia, and Raúl Valadez Azúa

2007a El Lobo Mexicano (*Canis lupus baileyi*) en el Contexto Cultural Prehispánico: Las Fuentes Escritas. *AMMVEPE* 18(3):68-76.

2007b El Lobo Mexicano (*Canis lupus baileyi*) en el Contexto Cultural Prehispánico: Los Restos Arqueozoológicos e Ibrconografía. *AMMVEPE* 18(4):95-106.

2009 *Estudio de los Cánidos Arqueológicos del México Prehispánico*. Textos básicos y manuales. Instituto Nacional de Antropología e Historia, Universidad Nacional Autónoma de México, Instituto de Investigaciones Antropológicas, México, D. F.

Bloch, Maurice

1974 Symbols, Song, Dance and Features of Articulation: Is Religion an Extreme Form of Traditional Authority? *European Journal of Sociology* 15(1):55-81.

1986 *From Blessing to Violence: History and Ideology in the Circumcision Ritual of the Merina of Madagascar*. Cambridge studies in social anthropology, Vol. 61. Cambridge University Press, Cambridge [England]; New York.

Blumenschine, Robert J., Curtis W. Marean, and Salvatore D. Capaldo

1996 Blind Tests of Inter-analyst Correspondence and Accuracy in the Identification of Cut Marks, Percussion Marks, and Carnivore Tooth Marks on Bone Surfaces. *Journal of Archaeolgocial Science* 23:493-507.

Bourdieu, Pierre

1977 *Outline of a Theory of Practice*. Cambridge studies in social anthropology ; no. 16, Vol. no. 16. Cambridge University Press, Cambridge [England]; New York.

Bouwman, Allison S.

2008 *The Effects of Acryloid B-72 and Duco Cement on the Carbon and Nitrogen Stable Isotope Analysis of Bone Collagen*. Unpublished M.A. Thesis, Anthropology, California State University Chico, Chico, California.

Bove, Frederick J. , and Sonia Madrano Busto

2003 Teotihuacan, Militarism, and Pacific Guatemala. In *The Maya and Teotihuacan: Reinterpreting Early Classic Interaction*, edited by Geoffrey E. Braswell, pp. 45-79. University of Texas, Austin.

Bradley, Richard

1998 *The Significance of Monuments: On the Shaping of Human Experience in Neolithic and Bronze Age Europe*. Routledge, London; New York.

Brady, James E., and Wendy Ashmore

1999 Mountains, Caves, Water: Ideational Landscapes of the Ancient Maya. In *Archaeologies of Landscape : Contemporary Perspectives*, edited by Wendy Ashmore and Arthur Bernard Knapp, pp. 124-145. Blackwell Publishers, Malden, Mass.

Brisbin, I. Lehir Jr., and C. Kenyon Wagner

1970 Some Health Problems Associated with the Maintenance of American Kestrels (*Falco sparverius*) in Captivity. *International Zoo Yearbook* 10(1):29-30.

Broda, Johanna

1988 Templo Mayor as Ritual Space. In *The Great Temple of Tenochtitlan: Center and Periphery in the Aztec World*, edited by Johanna Broda, David Carrasco, and Eduardo Matos Moctezuma, pp. 61-123. University of California Press, Berkeley.

1989 Geografía, Clima y Observación de la Naturaleza en la Mesoamérica Prehispánica. In *Las Máscaras de la Cueva de Santa Ana Teloxtoc*, edited by Ernesto Vargas, pp. 35-51. Serie antropológica. Universidad Nacional Autónoma de México, México, D.F.

Brown, Linda A, and Kitty F Emery

2008 Negotiations with the Animate Forest: Hunting Shrines in the Guatemalan Highlands. *Journal of Archaeological Method and Theory* 15(4):300-337.

Brown, Linda A.

2005 Planting the Bones: Hunting Ceremonialism at Contemporary and Ninteenth-Century Shrines in the Guatemalan Highlands. *Latin American Antiquity* 16(2):131-146.

Brück, Joanna, and Melissa Goodman

1999 *Making Places in the Prehistoric World: Themes in Settlement Archaeology*. UCL Press, London.

Bunn, Henry T., Laurence E. Bartram, and Elen Kroll

1988 Variability in Bone Assemblage Formation from Hadza Hunting, Scavenging, and Carcass Processing. *Journal of Anthropological Archaeology* 7:412-457.

Bunn, Henry T., and Ellen M. Kroll

1986 Systematic Butchery by Pli/Pleistocene Hominids at Olduvai Gorge, Tanzania. *Current Anthropology* 27(5):431-452.

Busatta, Sandra

2007 Good to Think: Animals and Power. *Antrocom* 4(1):3-11.

Cabrera Castro, Rubén

1998 La Serpiente Emplumada y el Jaguar Como Símbolo del Control Político en Teotihuacan. In *Historia Comparativa de las Religiones*, edited by Henry Karol Kocyba and Yólotl González Torres, pp. 197-220. Instituto Nacional de Antropología e Historia, México, D.F.

Cabrera Castro, Rubén, and Oralia Cabrera

1991 El Proyecto Templo de Quetzalcoatl: Planteamientos Generales y Resultados Preliminares. *Arqueología* 6:19-31.

Cabrera Castro, Rubén, Ignacio Rodriguez García, and Noel Morelos García, eds.

1982a *Memoria del Proyecto Arqueológico Teotihuacán 80-82*. Volume 1. Instituto Nacional de Antropología e Historia, México, D.F.

1982b *Teotihuacan 80-82: Primeros Resultados*. Instituto Nacional de Antropología e Historia, México, D.F.

1991a *Teotihuacan 1980-1982: Nuevas Interpretatciones*. Instituto Nacional de Antropología e Historia, Mexico, D.F.

Cabrera Castro, Rubén, Saburo Sugiyama, and George L. Cowgill

1991b The Templo de Quetzalcoatl Project at Teotihuacan. *Ancient Mesoamerica* 2:77-92.

Cabrera Cortés, Mercedes Oralia

2011 *Craft Production and Socio-Economic Marginality: Living on the Periphery of Urban Teotihuacan*. Ph.D. dissertation, Arizona State University, Tempe, Arizona. University Microfilms, Ann Arbor.

Carballo, David

2007 Implements of State Power: Weaponry and Martially Themed Obsidian Production Near the Moon Pyramid, Teotihuacan. *Ancient Mesoamerica* 18:173-190.

Carlson, John B.

1981 Olmec Concave Iron-Ore Mirrors: The Aesthetics of a Lithic Technology and the Lord of the Mirror. In *The Olmec & Their Neighbors: Essays in Memory of Matthew W. Stirling*, edited by Elizabeth P. Benson, pp. 117-147. Dumbarton Oaks Research Library and Collections, Trustees for Harvard University, Washington, D.C.

Carrasco, Davíd

1988 Myth, Cosmic Terror, and the Templo Mayor. In *The Great Temple of Tenochtitlan: Center and Periphery in the Aztec World*, edited by Johanna Broda, David Carrasco, and Eduardo Matos Moctezuma, pp. 124-162. University of California Press, Berkeley.

1990 *Religions of Mesoamerica: Cosmovision and Ceremonial Centers*. Waveland Press, Long Grove, Illinois.

1991a The Sacrifice of Tezcatlipoca: To Change Place. In *To Change Place: Aztec Ceremonial Landscapes*, edited by Davíd Carrasco, pp. 31-57. University Press of Colorado, Niwor, Colorado.

1991b *To Change Place: Aztec Ceremonial Landscapes*. University Press of Colorado, Niwor, Colorado.

2000 *Quetzalcoatl and the Irony of Empire: Myths and Prophecies in the Aztec Tradition*. University Press of Colorado, Boulder.

2005 Sacrifice [Further Considerations]. In *Encyclopedia of Religion*, edited by Lindsay Jones, pp. 8008-8010. Macmillan Reference USA, Detroit.

2008 Human Sacrifice/Dept Payments from the Aztec Point of View. In *The History of the Conquest of New Spain by Bernal Díaz del Castillo*, edited by Davíd Carrasco, pp. 458-465. University of New Mexico Press, Albuquerque.

Ceballos-Gónzales, G.J., G.J.S. Blanco, C. González, and E. Martínez

2006 *Panthera onca (jaguar). Distribución potencial*. Proyecto: DS006, Extraído del Proyecto DS006: Modelado de la distribución de las especies de mamíferos de México para un análisis

GAP.
http://www.conabio.gob.mx/informacion/metadata/gis/panoncagw.xml?httpcache=yes&_xsl=/db/metadata/xsl/fgdc_html.xsl_indent=no, accessed Feburary, 2014. Instituto de Biología, Universidad Nacional Autónoma de México, México, D.F.

Cervantes, Fernando A., Yolanda Hortelano Moncada, and Julieta Vargas Cuenca, eds.

2009 *60 Años de la Colección Nacional de Mamíferos del Instituto de Biología, UNAM: Aportaciones al Conocimiento y Consrvación de los Mamíferos Mexicanos*. Instituto de Biología, Universidad Nacional Autónoma de México, México, D.F.

Clark, John E.

2010 Aztec Dimensions of Holiness. In *The Archaeology of Measurement: Comprehending Heaven, Earth and Time in Ancient Societies*, edited by Iain Morley and Colin Renfrew, pp. 150-169. Cambridge University Press, New York.

Clayton, Sarah C.

2005 Interregional Relationships in Mesoamerica: Interpreting Maya Ceramics at Teotihuacan. *Latin American Antiquity* 16(4):427-448.

2009 *Ritual Diversity and Social Identities: A Study of Mortuary Behaviors at Teotihuacan*. Ph.D. dissertation, Arizona State University, Tempe, Arizona. University Microfilms, Ann Arbor.

Clutton-Brock, Juliet

1989 A Dog and a Donkey Excavated at Tell Brak. *Iraq* 51(217-224).

1994 The Unnatural World: Behavioural Aspects of Humans and Animals in the Process of Domestication. In *Animals and Human Society: Changing Perspectives*, edited by Aubrey Manning and James Serpell, pp. 23-35. Routledge, London; New York.

Coe, Michael D.

1972 Olmec Jaguars and Olmec Kings. In *The Cult of the Feline*, edited by Elizabeth P. Benson, pp. 1-18. Dumbarton Oaks Resrch Library and Collections, Washington, D.C.

Conneller, Chantal

2004 Becoming Deer: Corporeal Transformations at Star Carr. *Archaeological Dialogues* 11(01):37-56.

Cortés, Hernán

1971 *Cartas de Relación*, Vol. 7. Editorial Porrua, México, D.F.

Cowgill, George L.

1992 Toward a Political History of Teotihuacan. In *Ideology and Pre-Columbian Civilizations*, edited by Arthur A. Demorast and Geoffrey W. Conrad, pp. 261. School of American Research Press, Santa Fe, New Mexico.

2004 Origins and Development of Urbanism: Archaeological Perspectives. *Annual Review of Anthropology* 33:525-549.

2008 An Update on Teotihuacan. *Antiquity* 82:962-975.

Crockford, Susan J.

1997 *Osteometry of Makah and Coast Salish Dogs*. Archaeology Press, Burnaby.

Crowe, Douglass M.

1975 Aspects of Ageing, Growth, and Reproduction of Bobcats from Wyoming. *Journal of Mammalogy* 56(1):177-198.

Currier, Mary Jean P.

1983 *Felis concolor*. *Mammalian Species* 200:1-7.

Currier, Mary Jean Pfile

1979 *An Age Estimation Technique and Some Normal Blood Values for Mountain Lions (Felis concolor)*. Ph.D. dissertation, Colorado State University, Fort Collins, Colorado. University Microfilms, Ann Arbor.

Davies, Jessica J., Marian Fabiš, Ingrid Mainland, M. Richards, and Richard Thomas

2005 *Diet and Health in Past Animal Populations: Current Research and Future Directions*. 9th International Council for Archaeozoology Conference Proceedings, 2002 Durham, England. Oxbow Books, Oxford.

Delwiche, Constant C., and Pieter L. Steyn

1970 Nitrogen Isotope Fractionation in Soils and Microbial Reactions. *Environmental Science & Technology* 4(11):929-935.

DeMarrais, Elizabeth

2004 Materialization of Culture. In *Rethinking Materiality: The Engagement of Mind with the Material World*, edited by Elizabeth DeMarrais, Chris Gosden, and Colin Renfrew, pp. 11-22. McDonald Institute for Archaeological Research: Distributed by Oxbow Books, Cambridge, U.K.: Oxford: Oakville, Conn.

DeMarrais, Elizabeth, Luis Jaime Castillo, and Timothy Earle

1996 Ideology, Materialization, and Power Strategies. *Current Anthropology* 37(1):15-31.

DeMarrais, Elizabeth, Chris Gosden, and Colin Renfrew

2004 *Rethinking Materiality: The Engagement of Mind with the Material World*. McDonald Institute Monographs. McDonald Institute for Archaeological Research :Distributed by Oxbow Books, Cambridge [England]; Oxford; Oakville, Conn.

DeNiro, Michael J, and Samuel Epstein

1978 Influence of Diet on the Distribution of Carbon Isotopes in Animals. *Geochimica et cosmochimica acta* 42(5):495-506.

DeNiro, Michael J., and Samuel Epstein

1981 Influence of Diet on the Distribution of Nitrogen Isotopes in Animals. *Geochimica et Cosmochimica Acta* 45(3):341-351.

DeNiro, Michael J., and Stephen Weiner

1988 Chemical, Enzymatic and Spectroscopic Characterization of "Collagen" and Other Organic Fractions from Prehistoric Bones. *Geochimica et Cosmochimica Acta* 52(9):2197-2206.

Di Peso, Charles C., John B. Rinaldo, and Gloria J. Fenner

1974 *Casas Grandes: A Fallen Trading Center of the Gran Chichimeca*, Vol. 8. Amerind Foundation; Northland Press, Dragoon and Flagstaff, Arizona.

Díaz de Castillo, Bernal

2008 *The History of the Conquest of New Spain*. University of New Mexico Press, Edited and with an introduction by Davíd Carrasco. Albuquerque.

Dornan, Jennifer

2007 Beyond Belief: Religious Experience, Ritual, and Cultural Neuro-phenomenology in the Interpretation of Past Religious Systems. *Cambridge Archaeological Journal* 14(1):25-36.

Dorsal, Pedro R.

1925 Descubrimeintos Arqueológicos en el Templo de Quetzalcoatl, Teotihuacan. *Anales del Museo Nacional de Arqueología, Hisotira, y Etnografía* 1(33):216-219.

Douglas, Mary

1957 Animals in Lele Religious Symbolism. *Journal of the International African Institute* 27(1):46-58.

Drucker, R. David

1977 A Solar Orientation Framework for Teotihuacan. In *Los Procesos de Cambio en Mesoamerica y Areas Circunvecinas*, edited by, pp. 277-284. XV Mesa Redonda, Vol. II. Sociedad Mexicana de Antropología, Universidad de Guanajuato, México.

Durán, Diego

1971 *Book of the Gods and Rites and The Ancient Calendar*. Fernando Horcasitas and Doris Heyden, transl. The Civilization of the American Indian series, Vol. 102. University of Oklahoma Press, Norman.

Durkheim, Émile

1915 *The Elementary Forms of the Religious Life: A Study in Religious Sociology*. G. Allen & Unwin; Macmillan, London: New York.

Earle, Timothy

2001 Institutuionalization of Chiefdoms: Why Landscapes are Built. In *From Leaders to Rulers*, edited by Jonathan Haas, pp. 105-124. Kluwer Academic; Field Museum of Natural History, New York.

Elbroch, Mark

2006 *Animal Skulls: A Guide to North American Species*. Stackpole Books, Mechanicsburg, Pennsylvania.

Eliade, Mircea

1954 *The Myth of the Eternal Return*. Bollingen series, Vol. 46. Pantheon Books, New York.

Ellis, David H.

1979 Development of Behavior in the Golden Eagle. *Wildlife Monographs* (70):3-94.

Emery, Kitty F.

2013 *Animal Sacrifices in the Ancient Maya World*. Paper presented at 78th Annual Society for American Archaeology Conference, Honolulu, Hawaii, April 3-7, 2013, April 3-7, 2013.

Emmons, Louise, and François Feer

1997 *Neotropical Rainforest Mammals: A Field Guide*. University of Chicago Press, Chicago.

Espinosa, David A., Mónica Gómez, Verónica Ortega, Bernardo Rodríguez, and Raúl Valadez

In Press Advances Preliminares de la Arqueofauna Identificada en el Barrio Zapoteco, Teotihuacan, Estado de México, edited by Sandra Riego Ruiz. San Juan, Teotihuacan, Estado de México, 2011, Conference Proceedings of the 5a Mesa Redonda de Teotihuacan.

Fash, William L.

1988 A New Look at May Statecraft from Copan, Honduras. *Antiquity* 62(234):157-169.

1991 *Scribes, Warriors and Kings: The City of Copán and the Ancient Maya*. Thames & Hudson Ltd., London.

1998 Dynastic Architectural Programs: Intention and Design in Classic Maya Buildings at Copan and Other Sites. In *Function and Meaning in Classic Maya Architecture: A Symposium at Dumbarton Oaks, 7th and 8th October 1994*, edited by Stephen D. Houston, pp. 223-270. Dumbarton Oaks Research Library and Collection, Washington, D.C.

2013 A Millennial Legacy: The Teotihuacan Sun Pyramid as the Central Place in the Centennial of Mexican Independence, and the Archaeology of State in Mexico. In *Constructing, Deconstructing, and Reconstructing Social Identity- 2,000 years of Monumentality in Teotihuacan and Cholula, Mexico-*, edited by Saburo Sugiyama, Shigeru Kabata, Tomoko Taniguchi, and Etsuko Niwa, pp. 83-93. Cultural Symbiosis Research Institute, Aichi Prefectural University, Aichi [Japan].

Fash, William L., and Barbara W. Fash

1996 Building a World-View: Visual Communication in Classic Maya Architecture. *RES: Anthropology and Aesthetics* (29/30):127-147.

2000 Teotihuacan and the Maya: A Classic Heritage. In *Mesoamerica's Classic Heritage: From Teotihuacan to the Aztecs*, edited by Davíd Carrasco, Lindsay Jones, and Scott Sessions, pp. 433-464. University Press of Colorado, Boulder, Colorado.

Fash, William L., and Leonardo López Luján, eds.

2009 *The Art of Urbanism: How Mesoamerican Kingdoms Represented Themselves in Architecture and Imagery*. Dumbarton Oaks Rsearch Library and Collection, Washington, D.C.

Fash, William L., Alexandre Tokovinine, and Barbara W. Fash

2009 The House of New Fire at Teotihuacan and its Legacy in Mesoamerica. In *The Art of Urbanism: How Mesoamerican Kingdoms Represented Themselves in Architecture and Imagery*, edited by William L. Fash and Leonardo López Luján, pp. 201-229. Dumbarton Oaks Rsearch Library and Collection, Washington, D.C.

Fash, William L., Richard V. Williamson, Carlos Rudy Larios, and Joel Palka

1992 The Hieroglyphic Stariway and its Ancestors: Investigations of Copan Structure 10L-26. *Ancient Mesoamerica* 3:105-115.

Fewkes, J. Walter

1900 Property-Right in Eagles Among the Hopi. *American Anthropologist* 2(4):690-707.

Fikes, Jay C.

1985 *Huichol Indian Identity and Adaptation: Ritual, Shamanism, Ecology*. Ph.D. dissertation, University of Michigan, Ann Arbor. University Microfilms, Ann Arbor.

Firth, Raymond

1963 Offering and Sacrifice: Problems of Organization. *The Journal of the Royal Anthropological Institute of Great Britain and Ireland* 93(1):12-24.

Fischer, Albert

2007 Computerised Bone Templates as the Basis of a Practical Procedure to Record and Analyse Graphical Zooarchaeological Data. *Revista Electrónica de Arqueología PUCP* 2(1).

Fisher, John W. Jr.

1995 Bone Surface Modifications in Zooarchaeology. *Journal of Archaeological Method and Theory* 2(1):7-68.

Fiskesjö, Magnus

2001 Rising From Blood-Stained Fields: Royal Hunting and State Formation in Shang China. *Buletin of the Museum of Far Eastern Antiquities* 73:48-191.

Flad, Rowan K.

2001 Ritual or Structure? Analysis of Burial Elaboration at Dadianzi, Inner Mongolia. *Journal of East Asian Archaeology* 3(3-4):23-52.

Flad, Rowan K., and Pochan Chen

2013 *Ancient Central China: Centers and Peripheries Along the Yangzi River*. Case studies in early societies. Cambridge University Press, Cambridge [England]; New York.

Flad, Rowan K., and Zachary X. Hruby

2007 "Specialized" Production in Archaeological Contexts: Rethinking Specialization, the Social Value of Products, and the Practice of Production. *Archeological Papers of the American Anthropological Association* 17(1):1-19.

Fogelin, Lars

2007 The Archaeology of Religious Ritual. *Annual Review of Anthropology* 36:55-71.

2008 Introduction: Methods for the Archaeology of Religion. In *Religion, Archaeology, and the Material World*, edited by Lars Fogelin, pp. 1-14. Center for Archaeological Investigations, Southern Illinois University Carbondale, Carbondale, Illi.

Foucault, Michel

1980 *Power/Knowledge: Selected Interviews and Other Writings, 1972-1977*. Colin Gordon, Leo Marshall, John Mepham, and Kate Soper, transl. Pantheon Books, New York.

Freidel, David A., and Linda Schele

1989 Dead Kings and Living Temples: Dedication and Termination Rituals Among the Ancient Maya. In *Word and Image in Maya Culture: Explorations in Language, Writing, and Representation*, edited by William F. Hanks and Don Stephen Rice, pp. 223-243. University of Utah Press, Salt Lake City.

Fritts, Steven H., Robert O. Stephenson, Robert D. Hays, and Luigi Boitani

2003 Wolves and Humans. In *Wolves: Behavior, Ecology and Conservation*, edited by L. David Mech and Luigi Boitani, pp. 289-316. University of Chicago Press, Chicago.

Froehle, A. W., C. M. Kellner, and M. J. Schoeninger

2010 FOCUS: Effect of Diet and Protein Source on Carbon Stable Isotope Ratios in Collagen: Follow up to Warinner and Tuross (2009). *Journal of Archaeological Science* 37(10):2662-2670.

2012 Multivariate Carbon and Nitrogen Stable Isotope Model for the Reconstruction of Prehistoric Human Diet. *American Journal of Physical Anthropology* 147(3):352-369.

Fuente, Beatriz de la, ed.

2006a *La Pintura Mural Prehispánica en México, I Teotihuacan*. Universidad Nacional Autónoma de México, Instituto de Investigaciones Estéticas, México, D.F.

Fuente, Beatriz de la

2006b Zona 4: Animales Mitológicos. In *La Pintura Mural Prehispánica en México, I Teotihuacan*, edited by Beatriz de la Fuente, pp. 92-101. Universidad Nacional Autónoma de México, Instituto de Investigaciones Estéticas, México, D.F.

2006c Zone 3: Gran Puma. In *La Pintura Mural Prehispánica en México, I Teotihuacan*, edited by Beatriz de la Fuente, pp. 83-85. Universidad Nacional Autónoma de México, Instituto de Investigaciones Estéticas, México, D.F.

Fuller, B. T., J. L. Fuller, D. A. Harris, and R. E. M. Hedges

2006 Detection of Breastfeeding and Weaning in Modern Human Infants with Carbon and Nitrogen Stable Isotope Ratios. *American Journal of Physical Anthropology* 129(2):279-293.

Furst, Peter T.

1993 "I Am Black Jaguar!": Magical Spells and Shamainism of the Pemon of Southern Venezuela. In *South and Meso-American Native Spirituality: From the Cult of the Feathered Serpent to the Theology of Liberation*, edited by Gary H. Gossen, pp. 393-413. World Spirituality, Vol. 4. The Crossroad Publishing Company, New York.

Gamio, Manuel

1922 *La Poblacion del Valle de Teotihuacan*, Vol. I and II. Direccion de Talleres Graficos de la Secretaría de Fomento, México, D.F.

Garvie-Lok, Sandra J., Tamara L. Varney, and M. Anne Katzenberg

2004 Preparation of Bone Carbonate for Stable Isotope Analysis: The Effects of Treatment Time and Acid Concentration. *Journal of Archaeological Science* 31(6):763-776.

Garza, Mercedes de la

2001 La Serpiente en la Religión Maya. In *Animales y Plantas en la Cosmovisión Mesoamericana*, 1. edition, edited by Yólotl González Torres, pp. 145-157. Plaza y Valdés Editores: Instituto Nacional de Antropología e Historia: Sociedad Mexicana para el Estudio de las Religiones, México, D.F.

Gay, Samantha W., and Troy L. Best

1996 Age-Related Variation in Skulls of the Puma (*Puma concolor*). *Journal of Mammalogy* 77(1):191-198.

Gazzola, Julie

2009 Características Arquitectónicas de Algunas Construcciones de Fases Tempranas en Teotihuacán. *Arqueología* 42:216-233.

Geertz, Clifford

1973 *The Interpretation of Cultures: Selected Essays*. Basic Books, New York.

Giddings, Ruth Warner

1959 *Yaqui Myths and Legends*. Anthropological papers of the University of Arizona, Vol. no. 2. University of Arizona, Tucson, Arizona.

Gifford, Diane P.

1981 Taphonomy and Paleoecology A Critical Review of Archaeology's Sister Disciplines. In *Advances in Archaeological Mehod and Theory*, edited by Michael B. Schiffer, pp. 365-438. Academic Press, New York.

Gilbert, B. Miles

1990 *Mammalian Osteology*. Missouri Archaeological Society, Columbia, Missouri.

Gilbert, B. Miles, Larry D. Martin, and Howard G. Savage

1985 *Avian Osteology*. Modern Printing Co., Laramie, Wyoming.

Goepfert, Nicolas

2012 New Zooarchaeologial and Funerary Perspectives on Mochica Culture (A.D. 100-800), Peru. *Journal of Field Archaeology* 37(2):104-120.

Gómez Chávez, Sergio

2013 The Exploration of the Tunnel Under the Feathered Serpent Temple at Teotihuacan. First Results. In *Constructing, Deconstructing, and Reconstructing Social Identity- 2,000 years of Monumentality in Teotihuacan and Cholula, Mexico-*, edited by Saburo Sugiyama, Shigeru Kabata, Tomoko Taniguchi, and Etsuko Niwa, pp. 11-18. Cultural Symbiosis Research Institute, Aichi Prefectural University, Aichi [Japan].

Gompper, Matthew

2002 The Ecology of Northeast Coyotes: Current Knowledge and Priorities for Future Research. *Wildlife Conservation Society Working Paper* 17:1-48.

González Torres, Yólotl

2001 El Jaguar. In *Animales y Plantas en la Cosmovision Mesoamericana*, edited by Yólotl González Torres, pp. 123-144. Plaza y Valdés Editores: Instituto Nacional de Antropología e Historia: Sociedad Mexicana para el Estudio de las Religiones, Mexico, D.F. .

Gordon, Seton

1955 *The Golden Eagle: King of Birds*. Collins, London.

Gossen, Gary H.

1975 Animal Souls and Human Destiny in Chamula. *Man* 10(3):448-461.

1979 Temporal and Spatial Equivalents in Chamula Ritual Symbolism. In *Reader in Comparative Religion: An Anthropological Approach*, 4th edition, edited by William A. Lessa and Evon Z. Vogt, pp. 116-129. Harper & Row, New York.

1994 From Olmecs to Zapatistas: A Once and Future History of Souls. *American Anthropologist* 96(3):553-570.

Grigione, M. M., P. Beier, R. A. Hopkins, D. Neal, W. D. Padley, C. M Schonewald, and M. L. Johnson

2002 Ecological and Allometric Determinants of Home-range Size for Mountain Lions (*Puma concolor*). *Animal Conservation* 5:317-324.

Grove, David C.

1972 Omec Felines in Highland Central Mexico. In *The Cult of the Feline, A Conference in Pre-Columbian Iconography*, edited by Elizabeth P. Benson, pp. 153-164. Dumbarton Oakes Reserch Library and Collection, Washington, D.C.

Hale, James B.

1949 Aging Cottontail Rabbits by Bone Growth. *The Journal of Wildlife Management* 13(2):216-225.

Hall, E. Raymond

1981 *The Mammals of North America*, Vol. II. Wiley, New York.

Halliday, T.R., and P.A. Verrell

1988 Body Size and Age in Amphibians and Reptiles. *Journal of Herpetology* 22(3):253-265.

Hallowell, A. Irving

2002 Ojibwa Ontology, Behavior, and World View. In *Readings in Indigenous Religions*, edited by Graham Harvey, pp. 17-49. Continuum, London.

Hamerton-Kelly, Robert

1987 *Violent Origins: Walter Burkert, René Girard and Jonathan Z. Smith on Ritual Killing and Cultural Formation*. Stanford University Press, Stanford, Calif.

Hargrave, Lyndon Lane

1970 *Mexican Macaws: Comparative Osteology and Survey of Remains from the Southwest*. Anthropological papers of the University of Arizona, Vol. no. 20. University of Arizona Press, Tucson.

Harmata, Al, and George Montopoli

2013 Morphometric Sex Determination of North American Golden Eagles. *Journal of Raptor Research* 47(2):108-116.

Hawkes, Christopher

1954 Archaeological Theory and Method: Some Suggestions from the Old World. *American Anthropologist* 56:155-168.

Hedges, Robert E. M., and Linda M. Reynard

2007 Nitrogen Isotopes and the Trophic Level of Humans in Archaeology. *Journal of Archaeological Science* 34(8):1240-1251.

Henninger, Joseph

2005 Sacrifice [First Edition]. In *Encyclopedia of Religion*, edited by Lindsay Jones, pp. 7997-8008. Macmillan References, Detroit.

Herron, Gary B, Craig A Mortimore, and Marcus S Rawlings

1985 *Nevada Raptors: Their Biology and Management*. Department of Wildlife Biological Bulletin, Vol. 8. Nevada Department of Wildlife, Reno, Nevada.

Heyden, Doris

1981 Caves, Gods, and Mythos: World-View and Planning in Teotihuacan. In *Mesoamerican Sites and World-Views*, edited by Elizabeth P. Benson, pp. 1-35. Dumbarton Oaks Research Library and Collections, Washington, D.C.

Hidalgo Mihart, Mircea, Lisette Cantú Salazar, Alberto González Romero, and Carlos A. López González

2004 Historical and Present Distributuion of Coyote (*Canis latrans*) in Mexico and Central America. *Journal of Biogeography* 31:2025-2038.

Hill, Erica

2000 The Contextual Analysis of Animal Interments and Ritual Practice in Southwestern North America. *Kiva* 65(4):361-398.

2011 Animals as Agents: Hunting Ritual and Relational Ontologies in Prehistoric Alaska and Chukotka. *Cambridge Archaeological Journal* 21(03):407-426.

2013 Archaeology and Animal Persons: Toward a Prehistory of Human-Animal Relations. *Environment and Society: Advances in Research* 4:117-136.

Hill, Robert M.

1992 *Colonial Cakchiquels: Highland Maya Adaptations to Spanish Rule, 1600-1700*. Case studies in cultural anthropology. Harcourt Brace Jovanovich, Fort Worth.

Hillson, Simon

2005 *Teeth*. Cambridge University Press, Cambridge.

Hirsch, Eric, and Michael O'Hanlon

1995 *The Anthropology of Landscape: Perspectives on Place and Space*. Oxford studies in social and cultural anthropology. Clarendon Press; Oxford University Press, Oxford: New York.

Hirth, Kenneth G.

2003 The Altepetl and Urban Structure in Prehispanic Mesoamerica. In *El Urbanismo en Mesoamérica: Urbanism in Mesoamerica*, edited by William T. Sanders, Alba Guadalupe Mastache de Escobar, and Robert H. Cobean, pp. 57-84. Instituto Nacional de Antropología e Historia; Pennsylvania State University, México D.F.: University Park, Penn.

Hobson, Keith A.

1999 Tracing Origins and Migration of Wildlife Using Stable Isotopes: A Review. *Oecologia* 120(3):314-326.

Hobson, Keith A., Ray T. Alisauskas, and Robert G. Clark

1993 Stable-Nitrogen Isotope Enrichment in Avian Tissues Due to Fasting and Nutritional Stress: Implications for Isotopic Analyses of Diet. *The Condor* 95(2):388-394.

Hockett, Bryan Scott

1996 Corroded, Thinned and Polished Bones Created by Golden Eagles (*Aquila chrysaetos*): Taphonomic Implications for Archaeological Interpretations. *Journal of Archaeological Science* 23:587-591.

Hoffmeister, Donald F., and Earl G. Zimmerman

1967 Growth of the Skull in the Cottontail (*Sylvilagus floridanus*) and Its Application to Age-Determination. *American Midland Naturalist* 78(1):198-206.

Houston, Stephen D., ed.

1998 *Function and Meaning in Classic Maya Architecture: A Symposium at Dumbarton Oaks, 7th and 8th October 1994*. Dumbarton Oaks Research Library and Collection, Washington, D.C.

Houston, Stephen, and Karl Taube

2000 An Archaeology of the Senses: Perception and Cultural Expression in Ancient Mesoamerica. *Cambridge Archaeological Journal* 10(2):261-294.

Howell, Steve N. G., and Sophie Webb

1995 *A Guide to the Birds of Mexico and Northern Central America*. Oxford University Press, Oxford.

Hruby, Zachary X.

2007 Ritualized Chipped-Stone Production at Piedras Negras, Guatemala. In *Rethinking Craft Specialization in Complex Societies: Archeological Analyses of the Social Meaning of Production*, edited by Zachary X. Hruby, Rowan K. Flad, and Gwen Patrice Bennett, pp. 68-87. Archeological papers of the American Anthropological Association, no. 17. American Anthropological Association, Arlington, Virginia.

Hubert, Henri, and Marcel Mauss

1964 *Sacrifice: Its Nature and Function*. University of Chicago Press, Chicago.

Ikram, Salima

2005 *Divine Creatures: Animal Mummies in Ancient Egypt*. American University in Cairo Press, Cairo; New York.

Ingles, Lloyd G.

1941 Natural History Observations on the Audubon Cottontail. *Journal of Mammalogy* 22(3):227-250.

Ingold, Tim

1986 *The Appropriation of Nature: Essays on Human Ecology and Social Relations*. Manchester University Press, Manchester, UK.

1988a Introduction. In *What is an Animal?*, edited by, pp. 1-16. Unwin Hyman, London.

Ingold, Tim, ed.

1988b *What is an Animal?* Unwin Hyman, London.

Inomata, Takeshi

2001 The Power and Ideology of Artistic Creation: Elite Craft Specialists in Classic Maya Society. *Current Anthropology* 42(3):321-349.

2006 Plazas, Performers, and Spectators: Political Theaters of the Classic Maya. *Current Anthropology* 47(5):805-842.

Inomata, Takeshi, and Lawrence S. Coben

2006 Overture: An Invitation to the Archaeological Theater. In *Archaeology of Performance: Theaters of Power, Community, and Politics*, edited by Takeshi Inomata and Lawrence S. Coben, pp. 11-44. Altamira Press, Lanham, Maryland.

Insoll, Timothy

2004 *Archaeology, Ritual, Religion*. Themes in archaeology. Routledge, London ;New York.

Ishihara-Brito, Reiko, and Karl A. Taube

2012 Mosaic Mask. In *Ancient Maya Art at Dumbarton Oaks*, edited by Joanne Pillsbury, Miriam Doutriaux, Reiko Ishihara-Brito, and Alexandre Tokovinine, pp. 464-474. Pre-Columbian Art at Dumbarton Oaks. Dumbarton Oaks Research Library and Collection, Washington, D.C.

Isidro Luna, Xóchitl

2007 *Estudio Morfológico del Cráneo del Jaguar (Panthera onca) de México*. Unpublished B.A. Thesis, Facultad de Ciencias, Universidad Nacional Autónoma de México, México, D.F.

Jackson, Hartley H.T.

1951 Classification of the Races of the Coyote. In *The Clever Coyote*, edited by Stanley P. Young and Harthley H.T. Jackson, pp. 227-341. The Stackpole Company and Wildlife Manaement Institute, Harrisburg and Washington D.C.

Jolicoeur, Pierre

1975 Sexual Dimorphism and Geographical Distance as Factors of Skull Variation in the Wolf *Canis lupus L.* In *The Wild Canids: Their Systematics, Behavioral Ecology and Evolution*, edited by M.W. Fox, pp. 54-61. Van Nostrand Reinhold Company, New York.

Jones, Andrew

1998 Where Eagles Dare: Landscape, Animals and the Neolithic of Orkney. *Journal of Material Culture* 3(2):301-324.

Jones, J Knox, Hugh H Genoways, and James D Smith

1974 Annotated Checklist of Mammals of the Yucatan Peninsula, Mexico. III. Marsupialia, Insectivora, Primates, Edentata, Lagomorpha. *Occasional Papers The Museum Texas Tech University* 23:1-12.

Joyce, Rosemary A.

1992 Ideology in Action: Classic Maya Ritual Practice. In *Ancient Images, Ancient Thought : The Archaeology of Ideology* edited by A. Sean Goldsmith, Sandra Garvie, David Selin, and Jeannette Smith, pp. 497-505. Proceedings of the Twenty-third Annual Conference of the Archaeological Association of the University of Calgary. University of Calgary Archaeological Association, Calgary, Canada.

Kelley, David H.

1955 Quetzalcoatl and His Coyote Origins. *El Mexico Antiguo, Revista Internacional de Arqueologia, Etnologia, Folklore, Prehistoria, Historia Antigua y Linguistica Mexicanas* VIII:397-413.

Kellner, Corina M., and Margaret J. Schoeninger

2007 A Simple Carbon Isotope Model for Reconstructing Prehistoric Human Diet. *American Journal of Physical Anthropology* 133:1112-1127.

Kelly, Jeffrey F.

2000 Stable Isotopes of Carbon and Nitrogen in the Study of Avian and Mammalian Trophic Ecology. *Canadian Journal of Zoology* 78(1):1-27.

Kertzer, David I.

1991 The Role of Ritual in State-Formation. In *Religious Regimes and State-Formation: Perspective from European Ethnology*, edited by Eric R. Wolf, pp. 85-103. State University of New York Press, Albany, New York.

Kimura, Takeshi

1999 Bearing the 'Bare Facts' of Ritual. A Critique of Jonathan Z. Smith's Study of the Bear Ceremony Based on a Study of the Ainu Iyomante. *Numen* 46(1):88-114.

Kitagawa, Joseph M.

1961 Ainu bear Festival (*Iyomante*). *History of Religions* 1(1):95-151.

Klauber, Laurence M.

1937 A Statistical Study of the Rattlesnakes; IV: The Growth of the Rattlesnake. *Occasional Papers San Diego Society of Natural History* 3:1-56.

Klein, Richard G., and Kathryn Cruz-Uribe

1984 *The Analysis of Animal Bones from Archeological Sites*. Prehistoric archeology and ecology. University of Chicago Press, Chicago.

Klenck, Joel D.

1995 Bedouin Animal Scarifice Practices: Case Study in Israel. In *The Symbolic Role of Animals in Archaeology*, edited by Kathleen Ryan and Pam J. Crabtree, pp. 57-72. MASCA Research Papers in Science and Archaeology. MASCA, University of Pennsylvania Muesum of Archaeology and Anthropology, Philadelphia, Pennsylvania.

Knab, Timothy J.

2004 *The Dialogue of Erath and Sky: Dreams, Souls, Curing, and the Modern Aztec Underworld*. The University of Arizona Press, Tucson, Arizona.

Knapp, Arthur Bernard, and Wendy Ashmore

1999 Archaeological Landscapes: Constructed, Conceptualized, Ideational. In *Archaeologies of Landscape : Contemporary Perspectives*, edited by Wendy Ashmore and Arthur Bernard Knapp, pp. 1-30. Blackwell Publishers, Malden, Mass.

Koch, Paul L., Noreen Tuross, and Marilyn L. Fogel

1997 The Effects of Sample Treatment and Diagenesis on the Isotopic Integrity of Carbonate in Biogenic Hydroxylapatite. *Journal of Archaeological Science* 24(5):417-429.

Kowalski, Jeff K.

1999 Natural Order, Social Order, Political Legitimacy, and the Sacred City: The Architecture of Teotihuacan. In *Mesoamerican Architecture as a Cultural Symbol*, edited by Jeff K. Kowalski, pp. 76-109. Oxford University Press, Oxford and New York.

Krueger, Harold W, and Charles H Sullivan

1984 Models for Carbon Isotope Fractionation Between Diet and Bone. *Stable Isotopes in Nutrition* 258:205-220.

Kubler, George

1969 *Studies in Classic Maya Iconography*. Memoirs of the Connecticut Academy of Arts & Sciences, Vol. 18. The Conneticut Academy of Arts and Sciences, New Haven and Hamden, Conneticut.

1972 Jaguars in the Valley of Mexico. In *The Cult of the Feline, A Conference in Pre-Columbian Iconography*, edited by Elizabeth P. Benson, pp. 19-49. Dumbarton Oakes Reserch Library and Collection, Washington, D.C.

Kvam, T.

1984 Age Determination in Eurpean Lynx *Lynx l. lynx* by Incremental Lines in Tooth Cementum. *Acta Zool. Fennica* 171:221-223.

Kyriakidis, Evangelos

2007a Archaeologies of Ritual. In *The Archaeology of Ritual*, edited by Evangelos Kyriakidis, pp. 289-308. Cotsen Institute of Archaeology, University of California, Los Angeles, Los Angeles.

2007b Finding Ritual: Calibrating the Evidence. In *The Archaeology of Ritual*, edited by Evangelos Kyriakidis, pp. 9-22. Cotsen Institute of Archaeology, University of California, Los Angeles, Los Angeles.

2007c In Search of Ritual. In *The Archaeology of Ritual*, edited by Evangelos Kyriakidis, pp. 1-8. Cotsen Institute of Archaeology, University of California, Los Angeles, Los Angeles.

LaDuke, Thomas C.

1991 The Fossil Snakes of Pit 91, Rancho La. Brea, California. *Contributions in Science* 424:1-28.

Laneri, Nicola

2008 Text in Context: Praxis and Power of Funerary Rituals Among Elites in Ancient Mesopotamia. In *Religion, Archaeology, and the Material World*, edited by Lars Fogelin, pp. 196-215. Center for Archaeological Investigations, Carbondale, Illi.

Leach, Edmund

1964 Anthropological Aspects of Language: Animal Categories and Verbal Abuse. In *New Directions in the Study of Language*, edited by Eric H. Lenneberg, pp. 23-63. The Massachusetts Institute of Technology Press, Cambridge, Mass.

Legge, Anthony, John Williams, and Phoebe Williams

1991 The Determination of Season of Death from the Mandibles and Bones of the Domestic Sheep (*Ovis aries*). *Rivista di Studi Liguri* LVII(1-4):49-65.

2000 Lambs to the Slaughter: Sacrifice at Two Roman Temples in Southern England. In *Animal Bones, Human Societies*, edited by Peter Rowley-Conwy, pp. 152-157. Oxbow Books, Oxford and Oakville.

Leopold, Starker A.

1972 *Wildlife of Mexico: The Game Birds and Mammals*. University of California Press, Berkeley, Los Angeles, London.

Lévi-Strauss, Claude

1966 *The Savage Mind*. Nature of human society series. Weidenfeld and Nicolson, Letchworth, Hertfordshire [England].

1979 *Myth and Meaning*. Schocken Books, New York.

Lockhart, James

1992 *The Nahuas After the Conquest: A Social and Cultural History of the Indians of Central Mexico, Sixteenth Through Eighteenth Centuries*. Stanford University Press, Stanford, Calif.

López Austin, Alfredo

1973 *Hombre-Dios: Religión y Política en el Mundo Náhuatl*. Serie de cultura nahuatl. Monografías, 15. Universidad Nacional Autónoma de México, Instituto de Investigaciones Históricas, México, D.F.

1988 *The Human Body and Ideology: Concepts of the Ancient Nahuas*, Vol. 1. University of Utah Press, Salt Lake City.

1993 *The Myths of the Opossum: Pathways of Mesoamerican Mythology*. University of New Mexico Press, Albuquerque.

1997 *Tamoanchan, Tlalocan: Places of Mist*. Mesoamerican worlds. University Press of Colorado, Niwot, Colorado.

López Austin, Alfredo, and Leonardo López Luján

2009 *Monte Sagrado: Templo Mayor*. Instituto Nacional de Antropología e Historia, Universidad Nacional Autónoma de México, México, D.F.

López Austin, Alfredo, Leonardo López Lujan, and Saburo Sugiyama

1991 The Temple of Quetzalcoatl at Teotihuacan: Its Possible Ideological Significance. *Ancient Mesoamerica* 2:93-105.

López Luján, Leonardo

2005 *The Offerings of the Templo Mayor of Tenochtitlan*. University of New Mexico Press, Albuquerque.

López Lujan, Leonardo, Laura Filloy Nadal, Barbara Fash, William L. Fash, and Pilar Hernández

2006 The Destruction of Images at Teotihuacan: Anthropomorphic Sculpture, Elite Cults, and the End of a Civilization. *RES* 49-50:12-39.

López Lujan, Leonardo, and Alfredo López Austin

2009 The Mexica in Tula and Tula in Mexico-Tenochtitlan. *The Art of Urbanism: How Mesoamerican Kingdoms Represented Themselves in Architecture and Imagery*:384-422.

López Lujan, Leonardo, Héctor Neff, and Saburo Sugiyama

2000 The 9-Xi Vase: A Classic Thin Orange Vessel Found at Tenochtitlan. In *Mesoamerica's Classic Heritage: From Teotihuacan to the Aztecs*, edited by Davíd Carrasco, Lindsay Jones, and Scott Sessions, pp. 219-252. University Press of Colorado, Boulder.

López Luján, Leonardo, and Saburo Sugiyama

2008 *Burial 6: War, Sacrifice, and Cosmology Reflected in a Dedicatory Burial/Offering Complex at the Moon Pyramid*. Paper presented at 73rd Annual Society of American Archaeology Conference, Vancouver, Canada, March 26-30, 2008.

Losey, Robert J., Vladimir I. Bazaliiskii, Sandra Garvie-Lok, Mietje Germonpré, Jennifer A. Leonard, Andrew L. Allen, M. Anne Katzenberg, and Mikhail V. Sablin

2011 Canids as Persons: Early Neolithic Dog and Wolf Burials, Cis-Baikal, Siberia. *Journal of Anthropological Archaeology* 30(2):174-189.

Lyman, R. Lee

1987 Archaeofaunas and Butchery Studies: A Taphonomic Perspective. *Advances in Archaeological Method and Theory* 10:249-337.

1994 *Vertebrate Taphonomy*. Cambridge manuals in archaeology. Cambridge University Press, Cambridge [England]; New York.

Manzanilla Naim, Linda R., ed.

1993 *Anatomía de un Conjunto Residencial Teotihuacano en Oztoyahualco*. Volume I and II. Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México, México, D.F.

Manzanilla Naim, Linda R., and Leonardo López Luján

2001 Exploraciones en un Posible Palacio de Teotihuacan: El Proyecto Xalla (2000-2001). *Mexicon* XXIII(3):58-61.

Marcus, Joyce

2007 Rethinking Ritual. In *The Archaeology of Ritual*, edited by Evangelos Kyriakidis, pp. 43-76. Cotsen Institute of Archaeology, University of California, Los Angeles, Los Angeles.

Marcus, Joyce, and Kent V. Flannery

1994 Ancient Zapotec Ritual and Religion: An Application of the Direct Historical Approach. In *The ancient mind : elements of cognitive archaeology*, edited by Colin Renfrew and Ezra B. W. Zubrow, pp. 55-74. Cambridge University Press, Cambridge [England]; New York.

Marean, Curtis W., Yoshiko Abe, Peter J. Nilssen, and Elizabeth C. Stone

2001 Estimating the Minimum Number of Skeletal Elements (MNE) in Zooarchaeology: A Review and a New Image-Analysis GIS Approach. *American Antiquity* 66(2):333-348.

Martínez-Gutiérrez, P.G., J.I. Servín-Martínez, and E. Martínez-Meyer

2005 *Canis lupus baileyi (lobo gris mexicano). Distribución potencial histórica*. Proyecto: BE029, Extraído del proyecto BE029: Distribución Histórica, prospección actual y áreas potenciales para reintroducir lobo mexicano (*Canis lupus baileyi*) en Durango, Sur de la Sierra Madre Occidental, México. http://www.conabio.gob.mx/informacion/metadata/gis/disthistogw.xml?_httpcache=yes&_xsl=/db/metadata/xsl/fgdc_html.xsl&_indent=no, accessed Feburary, 2014. Instituto de Ciencias Sociales. Universidad Juárez del Estado de Durango, Mexico.

Mastache, Alba Guadalupe, Dan M. Healan, and Robert H. Cobean

2009 Four Hundred Years of Settlement and Cultural Continuity in Epiclassic and Early Postclassic Tula. In *The Art of Urbanism: How Mesoamerican Kingdoms Represented Themselves in Architecture and Imagery*, edited by William L. Fash and Leonardo López Luján, pp. 290-328. Dumbarton Oaks Rsearch Library and Collection, Washington, D.C.

Matos Moctezuma, Eduardo

1986 *Vida y Muerte en el Templo Mayor*. Ediciones Océano, Mexico, D.F.

1995 Excavaciones Recientes en la Pirámide del Sol, 1993-1994. In *La Pirámide del Sol, Teotihuacán: Antología*, edited by Eduardo Matos, pp. 312-329. Artes de México, México, D.F.

1999 The Templo Mayor of Tenochtitlan: Cosmic Center of the Aztec Universe. In *Mesoamerican Architecture as a Cultural Symbol*, edited by Jeff K. Kowalski, pp. 199-219. Oxford University Press, Oxford and New York.

2002 Teotihuacan y Tula: Su Presencia en Tenochtitlan. In *Ideología y Política a Través de Materiales, Imágenes y Símbolos*, edited by María Elena Ruiz Gallut, pp. 117-136. Memoria de la Primera Mesa Redonda de Teotihuacan. Universidad Nacional Autónoma de México, Instituto Nacional de Antropología e Historia, México, D.F.

McAnany, Patricia Ann

1998 Ancestors and the Classic Maya Built Environment. In *Function and Meaning in Classic Maya Architecture: A Symposium at Dumbarton Oaks, 7th and 8th October 1994*, edited by Stephen D. Houston, pp. 271-298. Dumbarton Oaks Research Library and Collection, Washington, D.C.

2008 Shaping Social Difference: Political and Ritual Economy of Classic Maya Royal Courts. In *Dimensions of Ritual Economy*, edited by E. Christian Wells and Patricia Ann McAnany, pp. 219-247. Research in Economic Anthropology. JAI Press, Bingley [England].

McAnany, Patricia Ann, and E. Christian Wells

2008 Toward a Theory of Ritual Economy. In *Dimensions of Ritual Economy*, edited by E. Christian Wells and Patricia Ann McAnany, pp. 1-16. Research in Economic Anthropology. JAI Press, Bingley [England].

McBride, Roy T.

1980 *The Mexican Wolf (Canis lupus baileyi): A Historical Review and Observations on its Status and Distributuion*. Endangered Species Report Vol. 8. U.S. Fish and Wildlife Service, Albuquerque.

McCafferty, Geoffrey G.

2008 Altepetl: Cholula's Great Pyramid as 'Water-Mountain'. In *Flowing Through Time: Exploring Archaeology Through Humans and their Aquatic Environment*, edited by Larry Steinbsener, Beau Cripps, Metaxia Georgopoulous, and Jim Cals, pp. 20-25. University of Calgary Press, Calgary [Canada].

McClung de Tapia, Emily, and Nawa Sugiyama

2012 Conservando la Diversidad Biocultural de México: El Uso de Algunas Plantas y Animales en el Pasado y Presente. *Arqueología Mexicana* XIX(114):20-25.

McKusick, Charmion R.

2001 *Southwest Birds of Sacrifice*. The Arizona Archaeologist. Arizona Archaeological Society, Globe, Arizona.

McNiven, Ian J

2010 Navigating the Human-Animal Divide: Marine Mammal Hunters and Rituals of Sensory Allurement. *World Archaeology* 42(2):215-230.

Meadow, Richard H.

1978a "BONECODE" A System of Numerical Coding for Faunal Data from Middle Eastern Sites In *Approaches to Faunal Analysis in the Middle East*, edited by Richard H. Meadow and Melinda A. Zeder, pp. 169-186. Peabody Museum Bulletin 2, Cambridge, MA.

1978b Effects of context on the interpretation of faunal analysis in the Middle East. In *Approaches to faunal analysis in the Middle East*, edited by Richard H. Meadow and Melinda A. Zeder, pp. 15-21.

1980 Animal Bones: Problems for the archaeologist together with some possible solutions. *Paléorient* 6:65-77.

Mech, L. David, and Luigi Boitani

2003 Wolf Social Ecology. In *Wolves : Behavior, Ecology, and Conservation*, edited by L. David Mech and Luigi Boitani, pp. 1-34. University of Chicago Press, Chicago.

Meskell, Lynn

2008 The Nature of the Beast: Curating Animals and Ancestors at Çatalhöyük. *World Archaeology* 40(3):373-389.

Michelet, Dominique, and Gregory Pereira

2009 Teotihuacan y el Occidente de México. In *Teotihuacan: Ciudad de los Dioses*, 1 edition, edited by Felipe R. Solís Olguín, pp. 79-83. Instituto Nacional de Antropología e Historia, México, D. F.

Miller, Arthur G.

1973 *The Mural Painting of Teotihuacán*. Dumbarton Oaks, Washington, D.C.

Miller, Mary, and Karl Taube

1993 *An Illustrated Dictionary of The Gods and Symbols of Ancient Mexico and the Maya*. Thames & Hudson Ltd., London.

Millon, Clara

1988 Coyote With Sacrificial Knife. In *Feathered Serpents and Flowering Trees: Reconstructing the Murals of Teotihuacan*, edited by Kathleen Berrin, pp. 207-217. The Fine Arts Museum of San Francisco, Seattle.

Millon, René

1960 The Beginnings of Teotihuacan. *American Antiquity* 26(1):1-10.

1981 Teotihuacan: City, State, and Civilization. In *Supplement to the Handbook of Middle American Indians*, edited by Jeremy A. Sabloff, pp. 198-243. University of Texas Press, Austin.

1992 Teotihuacan Studies: From 1950 to 1990 and Beyond. In *Art, Ideology, and the City of Teotihuacan: A Symposium at Dumbarton Oaks, 8th and 9th October 1988*, edited by Janet Catherine Berlo, pp. 339-429. Dumbarton Oaks Research Library and Collection, Washington, D.C.

Millon, René, and Bruce Drewitt

1961 Earlier Structures within the Pyramid of the Sun at Teotihuacan. *American Antiquity* 26(3):371-380.

Millon, René, Bruce Drewitt, and James A. Bennyhoff

1965 The Pyramid of the Sun at Teotihuacán: 1959 Investigations. *Transactions of the American Philosophical Society* 55(6):5-93.

Millon, René, Bruce Drewitt, and George L. Cowgill

1973 *Urbanization at Teotihuacan, Mexico*, Vol. 1, Part 2. University of Texas Press, Austin, Texas.

Minagawa, Masao, and Eitaro Wada

1984 Stepwise Enrichment of ^{15}N Along Food Chains: Further Evidence and the Relation Between δ^{15}N and Animal Age. *Geochimica et Cosmochimica Acta* 48(5):1135-1140.

Minakami, Korebumi

1979 An Estimation of Age and Life-span of the Genus Trimeresurus (Reptilia, Serpents, Viperidae) on Amami Oshima Island, Japan. *Journal of Herpetology* 13(2):147-152.

Mock, Shirley Boteler, ed.

1998 *The Sowing and the Dawning: Termination, Dedication, and Transformation in the Archaeological and Ethnographic Record of Mesoamerica*. University of New Mexico Press, Albuquerque.

Monaghan, John

1998 Dedication: Ritual or Production? In *The Sowing and the Dawning: Termination, Dedication, and Transformation in the Archaeological and Ethnographic Record of Mesoamerica*, edited by Shirley Boteler Mock, pp. 47-52. University of New Mexico Press, Albuquerque.

Monroy-Vilchis, Octavio, Clarita Rodríguez-Soto, Martha Zarco-González, and Vicente Urios

2009 Cougar and Jaguar Habitat Use and Activity Patterns in Central Mexico. *Animal Biology* 59(2):145-157.

Montserrat Morales-Mejía, Fabiola, Joaquín Arroyo-Cabrales, and Oscar J. Polaco

2010 Estudio Comparativo de Algunos Elementos de las Extremidades Anteriores y Posteriores y Piezas Dentales de Puma (*Puma concolor*) y Jaguar (*Panthera onca*). *TIP Revista Especializada en Ciencias Químico-Biológicas* 13(2):73-90.

Moore, Jerry D.

1996 *Architecture and Power in the Ancient Andes: The Archaeology of Public Buildings*. New studies in archaeology. Cambridge University Press, Cambridge [England]; New York.

Morales Puente, Pedro, Edith Cienfuegos Alvarado, Linda R Manzanilla, and Francisco Javier Otero Trujano

2012 Estudio de la Paleodieta Empleando Isótopos Estables de los Elementos Carbono, Oxígeno y Nitrógeno en Restos Humanos y de Fauna Encontrados en el Barrio Teotihuacano de Teopancazco. In *Estudios Arqueométricos del Centro de Barrio de Teopancazco en Teotihuacan*, edited by Linda R Manzanilla, pp. 347-423. Instituto de Investigaciones Antropológicas, UNAM, México, D.F.

Mossman, Archie S.

1955 Reproduction of the Brush Rabbit in California. *The Journal of Wildlife Management* 19(2):177-184.

Murakami, Tatsuya

2010 *Power Relations and Urban Landscape Formation: A Study of Construction Labor and Resources at Teotihuacan*. Ph.D. dissertation, Arizona State University, Tempe, Arizona. University Microfilms, Ann Arbor.

Nicholson, Henry B.

1955 Montezuma's Zoo. *Pacific Discovery* 8(4):3-11.

Nielsen-Marsh, C. M., C. I. Smith, M. M. E. Jans, A. Nord, H. Kars, and M. J. Collins

2007 Bone Diagenesis in the European Holocene II: Taphonomic and EEnvironmental Considerations. *Journal of Archaeological Science* 34(9):1523-1531.

Noguera, Eduardo

1935 Antecedentes y Relaciones de la Cultura Teotihuacana. *El Mexico Antiguo* 3(5-8):3-90.

Núñez, Rodrigo, Brian Miller, and Fred Lindzey

2000 Food Habits of Jaguars and Pumas in Jalisco, Mexico. *Journal of Zoology* 252(3):373-379.

O'Leary, Marion H

1988 Carbon Isotopes in Photosynthesis: Fractionation Techniques May Reveal New Aspects of Carbon Dynamics in Plants. *Bioscience* 38(5):328-336.

Olsen, Stanley J.

1968 *Fish, Amphibian and Reptile Remains from Archaeological Sites*. Papers of the Peabody Museum of Archaeology and Ethnology, Vol. LVI No.2. Harvard University, Cambridge, Massachusetts.

1982 *An Osteology of Some Maya Mammals*. Papers of the Peabody Museum of Arcaheology and Ethnology, Vol. 73. Harvard University, Cambridge, Massachusetts.

1990 *Mammal Remains from Archaeological Sites: Part I Southeastern and Southwestern United States*. Papers of the Peabody Museum of Archaeology and Ethnology, Vol. Vol.56 No. 1. Peabody Museum of Arcaheology and Ethnology, Harvard University, Cambridge, Massachusetts.

Ortner, Sherry B.

1973 On Key Symbols. *American Anthropologist* 75:1338-46.

Paddock, John

1983 Topic 52, The Oaxaca Barrio at Teotihuacán. In *The Cloud People, Divergent Evolution of the Zapotec and Mixtec Civilizations*, edited by Kent V. Flannery and Joyce Marcus, pp. 170-175. Academic Press, New York and London.

Palka, Joel W.

2002 Left/right Symbolism and the Body in Ancient Maya Iconography and Culture. *Latin American Antiquity* 13(4):419-443.

Parkin, David

1992 Ritual as Spatial Direction and Bodily Division. In *Understanding Rituals*, edited by Daniel de Coppet, pp. 11-25. Routledge, London; New York.

Parsons, Jeffrey R.

2006 The Aquatic Component of Aztec Subsistence: Hunters, Fishers, and Collectors in an Urbanized Society. In *Arqueología e Historia del Centro de México: Homenaje a Eduardo Matos Moctezuma*, edited by Leonardo López Luján, Davíd Carrasco, and Lourdes Cué, pp. 241-256. Instituto Nacional de Antropología e Historia, México, D.F.

Patton, Kimberley C.

2006 Animal Sacrifice: Metaphysics of the Sublimated Victim. In *A Communion of Subjects: Animals in Religion, Science, and Ethics*, edited by Paul Waldau and Kimberley C. Patton, pp. 391-405. Columbia University Press, New York.

Paztory, Esther

1988 Feathered Feline and Bird Border. In *Feathered Serpents and Flowering Trees: Reconstructing the Murals of Teotihuacan*, edited by Kathleen Berrin, pp. 185-193. Fine Arts Museum of San Francisco, Seattle, Washington.

Pérez, José R.

1935 Exploración del Tunel de la Pirámide del Sol. *El Mexico Antiguo* 3(5-8):91-95.

Pinzón Castaño, Carlos Ernesto

2002 El Chamán y Sus dos Anillos. In *Rostros Culturales de la Fauna: Las Relaciones Entre los Humanos y los Animales en el Contexto Colombiano*, edited by Astrid Ulloa, pp. 57-71. Instituto Columbiano de Antropología e Historia, Fundación Natura, Columbia.

Pitsko, Leigh Elizabeth

2003 *Wild Tigers in Captivity: A Study of the Effects of the Captive Environment on Tiger Behavior*. Masters of Science dissertation, Virginia Polytechnic Institute and State University. University Microfilms, Ann Arbor.

Plank, Shannon E.

2004 *Maya Dwellings in Hieroglyphs and Archaeology: An Integrative Approach to Ancient Architecture and Spatial Cognition*. BAR international series, Vol. 1324. John and Erica Hedges Ltd., Oxford.

Poage, Michael A., and C. Page Chamberlain

2001 Empirical Relationships Between Elevation and the Stable Isotope Composition of Precipitation and Surface waters: Considerations for Studies of Paleoelevation Change. *American Journal of Science* 301:1-15.

Pohl, Mary D.

1977 Hunting in the Maya Village of San Antonio, Rio Hondo, Orange Walk District, Belize. *Journal of Belizean Affairs* 5:52-63.

1991 Women, Animal Rearing, and Social Status: The Case of the Formative Period Maya of Central America. In *The Archaeology of Gender: Proceedings of the Twenty-Second Annual Conference of the Archaeological Association of the University of Calgary*, edited by Dale Walde and Noreen D. Willows, pp. 392-399. University of Calgary Archaeological Association, Calgary [Canada].

Pohl, Mary D., and Lawrence H. Feldman

1982 The Traditional Role of Women and Animals in Lowland Maya Economy. In *Maya Subsistence: Studies in Memory of Dennis E. Puleston*, edited by Kent V. Flannery, pp. 295-311. Academic Press, New York.

Polaco, Oscar J., ed.

1991 *La Fauna en el Templo Mayor*. Asociación de Amigos del Templo Mayor, Instituo Nacional de Antropología, México, D.F.

2004 The Ritual Fauna of the Moon Pyramid. In *Voyage to the Center of the Moon Pyramid: Recent Discoveries in Teotihuacan*, edited by Saburo Sugiyama, pp. 40-42. Arizona State University, INAH, Mexico, D.F.

Price, T. Douglas, Margaret J. Schoeninger, and George J. Armelagos

1985 Bone Chemistry and Past Behavior: An Overview. *Journal of Human Evolution* 14(5):419-447.

Quezada Ramírez, Osiris , Norma Valentín Maldonado, and Amaranta Argüelles Echevarría

2010 Taxidermia y Cautiverio de Águilas en Tenochtitlan. *Arqueología Mexicana* XVII(105):18-23.

Rabinowitz, A. R., and B. G. Jr. Nottingham

1986 Ecology and Behaviour of the Jaguar (*Panthera onca*) in Belize, Central America. *Journal of Zoology London A* 210:149-159.

Ramamoorthy, T. P., Robert Bye, Antonio Lot, and John Fa

1993 *Biological Diversity of Mexico: Origins and Distribution*. Symposium on the Biological Diversity of, Mexico. Oxford University Press, New York.

Ramírez-Bautista, Aurelio, Uriel Hernández-Salinas, Uri Omar García-Vázquez, Adrian Leyte-Manrique, and Luis Canseco-Márquez

2009 *Herpetofauna del Valle de México: Diversidad y Conservación*. Universidad Autónoma del Estado de Hidalgo, Hidalgo, Mexico.

Rapoport, Amos

1994 Spatial Organization adn the Built Environment. In *Companion Encyclopedia of Anthropology*, edited by Tim Ingold, pp. 460-502. Routledge, London; New York.

Rappaport, Roy A.

1979 *Ecology, Meaning, and Religion*. North Atlantic Books, Richmond, Calif. .

1992 Riutal, Time, and Eternity. *Zygon* 27(1):5-30.

Rattray, Evelyn Childs

1975 Some Clarifications on the Early Teotihuacan Ceramic Sequence. In *XLI Congreso Internacional de Americanistas*, edited by, pp. 364-368. Instituto Nacional de Antropología e Historia, México, D.F.

2001 *Teotihacan: Cerámica, Cronología y Tendencias Culturales*. Serie Arqueología de México. Instituto Nacional de Antropología e Historia, México, D.F.

Rawlings, Tiffany A., and Jonathan C. Driver

2010 Paleodiet of Domestic Turkey, Shields Pueblo (5MT3807), Colorado: Isotopic Analysis and its Implications for Care of a Household Domesticate. *Journal of Archaeological Science* 37(10):2433-2441.

Reese-Taylor, Kathryn, Rex Koontz, and Annabeth Headrick

2001 *Landscape and Power in Ancient Mesoamerica*. Westview Press, Boulder, Colo.

Reid, Fiona

1997 *A Field Guide to the Mammals of Central America & Southeast Mexico*. Oxford University Press, New York.

Reina, Ruben E.

1967 Milpas and Milperos: Implications for Prehistoric Times. *American Anthropologist* 69(1):1-20.

Reitz, Elizabeth J., and Elizabeth S. Wing

2004 *Zooarchaeology*. Cambridge Manuals in Archaeology. Cambridge University Press, Cambridge [England].

Renfrew, Colin

2007 The Archaeology of Ritual, of Cult, and of Religion. In *The Archaeology of Ritual*, edited by Evangelos Kyriakidis, pp. 109-122. Cotsen Institute of Archaeology, University of California, Los Angeles, Los Angeles.

Renfrew, Colin, and Ezra B. W. Zubrow

1994 *The Ancient Mind: Elements of Cognitive Archaeology*. New directions in archaeology. Cambridge University Press, Cambridge [England]; New York.

Robb, John E

1998 The Archaeology of Symbols. *Annual Review of Anthropology* 27:329-346.

Robertson, Ian Goardon

2001 *Mapping the Social Landscape on and Early Urban Center: Socio-Spatial Variation in Teotihuacan*. Ph. D dissertation, Arizona State University, Tempe, Arizona. University Microfilms, Ann Arbor.

Rodríguez Galicia, Bernardo

2000 *Estudio Morfologico y Morfometrico, Craneal y Dental, de Perros (Canis familiaris) y Lobos (Canis lupus); Hallados en Teotihuacan y su Aplicacion en la Arqueozoologia*. Unpublished B.A. thesis, Facultad de Ciencias, Universidad Nacional Autonoma de México, México, D.F.

2006 *El Uso Diferencial del Recurso Fáunico en Teopancazco, Teotihuacan, y su Importancia en las Áreas de Actividad*. Unpublished M.A. thesis, Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México, México, D.F.

2010 *Captura, Preparación y Uso Diferencial de la Ictiofauna Encontrada en el Sitio Arqueológico de Teopancazco, Teotihuacan*. Unpublished Ph.D dissertation, Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México, México, D.F.

Rodríguez Galicia, Bernardo, and Raúl Valadez Azúa

2013 Vestigios del Recurso Costero en el Sitio Arqueológico de Teopancazco, Teotihuacan, Estado de México. *Revista Española de Antropología Americana* 43(1):9-29.

Rogers, Juliet, and Tony Waldron

1995 *A Field Guide to Joint Disease in Archaeology*. John Wiley & Sons, New York.

Rosa, Carlos Leonardo de la, and Claudia C. Nocke

2000 *A Guide to the Carnivores of Central America: Natural History, Ecology, and Conservation*. University of Texas Press, Austin.

Russell, Nerissa

2012a Hunting Sacrifice at Neolithic Çatalhöyük. In *Sacred Killing: The Archaeology of Sacrifice in the Ancient Near East*, edited by Anne Porter and Glenn M. Schwartz, pp. 79-95. Eisenbrauns, Winona Lake, Indiana.

2012b *Social Zooarchaeology: Humans an Animals in Prehistory*. Cambridge University Press, Cambridge [England].

Rylands, Anthony B., Colin P. Groves, Russell A. Mittermeier, Liliana Cortés-Ortiz, and Justin J.H. Hines

2006 Taxonomy and Distribution of Mesoamerican Primates. In *New Perspectives in the Study of Mesoamerican Primates: Distribution, Ecology, Behavior, and Conservation*, edited by Alejandro Estrada, pp. 29-79. Springer, New York.

Sahagún, fray Bernardino de

1956 *Historia General de las Cosas de Nueva España*. Porrúa, México, D.F.

1963 *Florentine Codex. Book 11-Earthy Things*. Charles E. Dibble and Arthur J.O. Anderson, transl. The School of American Research and the University of Utah, Santa Fe, New Mexico.

1979 *Florentine Codex. Book 8-Kings and Lords*. The School of American Research and the University of Utah, Santa Fe, New Mexico.

1981 *Florentine Codex. Book 2-The Ceremonies*. The School of American Research and the University of Utah, Santa Fe, New Mexico.

Sahlins, Marshall David

1981 *Historical Metaphors and Mythical Realities: Structure in the Early History of the Sandwich Islands kingdom*. ASAO special publications Vol. 1. University of Michigan Press, Ann Arbor.

Sánchez Alaniz, José Ignacio

2000 *Las Unidades Habitacionales en Teotihuacan: el Caso de Bidasoa*. Colección Cientifica, Vol. 421. Instituto Nacional de Antropología e Historia, México, D.F.

Sanders, William T.

1965 *The Cultural Ecology of the Teotihuacan Valley: A Preliminary Report of the Results of the Teotihuacan Valley Project*. Pennsylvania State University, University Park, Pennsylvania.

Sanders, William T., Jeffery R. Parsons, and Robert S. Santley

1979 *The Basin of Mexico: Ecological Processes in the Evolution of a Civilization*. Academic Press, New York.

Sarabia G., Alejandro

2002 *Trabajos de Consolidación y Mantenimiento en la Base de la Plataforma Adosada de la Pirámide del Sol, Teotihuacán México. Unidad de Salvamento Arqueológico Teotihuacán: Informe Técnico 2000 VI*. Site Report in Archivo Técnico de la Coordinación de Arqueología, INAH, México, D.F.

2008 Más de Cien Años de Exploraciones en la Pirámide del Sol. *Arqueología Mexicana* XVI(92):18-23.

Sarabia G., Alejandro, and Saburo Sugiyama

2009 *Informe de la Investigación y Conservación en el Complejo Arquitectónico de la Pirámide del Sol, Teotihuacán, Mexico*. Site report in Archivo Técnico de la Coordinación de Arqueología, Instituto Nacional de Arqueología e Historia, México, D.F.

Saunders, Nicholas J.

1984 Jaguars, Rain and Blood: Religious Symbolism in Acatlán, Guerrero, Mexico. *Cambridge Anthropology* 9(1):77-81.

1989 *People of the Jaguar: The Living Spirit of Ancient America*. Souvenir Press, London.

1990 Tezcatlipoca: Jaguar Metaphors and the Aztec Mirror of Nature. In *Signifying Animals: Human Meaning in the Natural World*, edited by Roy G. Willis, pp. 159-177. One world archaeology. Unwin Hyman, London; Boston.

1991 *The Jaguars of Culture, Symbolizing Humanity in Pre-Columbian and American Societies*. Unpublished Doctoral Dissertation, Faculty of Arts, Archaeology, University of Southampton.

1994 Predators of Culture: Jaguar Symbolism and Mesoamerican Elites. *World Archaeology* 26(1):104-117.

1998 *Icons of Power: Feline Symbolism in the Americas*. Routledge, London and New York.

Schaefer, Stacy B., and Peter T. Furst

1996 *People of the Peyote: Huichol Indian History, Religion, & Survival*. University of New Mexico Press, Albuquerque.

Schávelzon, Daniel

1983 La Primera Excavación Arqueológica de América: Teotihuacán en 1675. *Anales de Antropología I: Arqueología e Antropología Física* 20:121-134.

Schlesinger, Victoria

2001 *Animals and Plants of the Ancient Maya: A Guide*. University of Texas Press, Austin.

Schmitt, Dave N., and Kenneth E. Juell

1994 Toward the Identification of Coyote Scatological Faunal Accumulations in Archaeological Contexts. *Journal of Archaeological Science* 21(2):249-262.

Schoeninger, Margaret J, Michael J DeNiro, and Henrik Tauber

1983 Stable Nitrogen Isotope Ratios of Bone Collagen Reflect Marine and Terrestrial Components of Prehistoric Human Diet. *Science* 220(4604):1381-1383.

Schoeninger, Margaret J.

1985 Trophic Level Effects on 15N/14N and 13C/12C Ratios in Bone Collagen and Strontium Levels in Bone Mineral. *Journal of Human Evolution* 14(5):515-525.

2009 Stable Isotope Evidence for the Adoption of Maize Agriculture. *Current Anthropology* 50(5):633-640.

Schoeninger, Margaret J., and Michael J. DeNiro

1984 Nitrogen and Carbon Isotopic Composition of Bone Collagen from Marine and Terrestrial Animals. *Geochimica et Cosmochimica Acta* 48(4):625-639.

Schoeninger, Margaret J., Katherine M. Moore, Matthew L. Murray, and John D. Kingston

1989 Detection of Bone Preservation in Archaeological and Fossil Samples. *Applied Geochemistry* 4(3):281-292.

Schwarcz, Henry P.

1991 Some Theoretical Aspects of Isotope Paleodiet Studies. *Journal of Archaeological Science* 18(3):261-275.

Schwarcz, Henry P., and Margaret J. Schoeninger

2011 Stable Isotopes of Carbon and Nitrogen as Tracers for Paleo-Diet Reconstruction. In *Handbook of Environmental Isotope Geochemistry*, edited by Mark Baskaran, pp. 725-742. Springer-Verlag, Berlin, Heidelberg.

Seidensticker, John C. IV, Maurice G. Hornocker, Wilbur V. Wiles, and John P. Messick

1973 Mountain Lion Social Organization in the Idaho Primitive Area. *Wildlife Monographs* 35:3-60.

Séjourné, Laurette

1966 *Arquitectura y Pintura en Teotihuacán*. Siglo XXI Editores, México, D.F.

Seler, Eduard

1986 *Plano Geroglifico de Santiago Guevea*. Colección de Disertaciones sobre Lenguas y Arqueologías Americanas. Imprenta Madero S.A., México, D.F.

2004 *Las Imágenes de Animales en los Manuscritos Mexicanos y Maya*. Casa Juan Pablos, México, D.F.

Serjeantson, Dale

2000 Good to Eat and Good to Think With: Classifying Animals from Complex Sites. In *Animal Bones, Human Societies*, edited by P. Rowley-Conwy, pp. 179-189. Oxbow Books, Oxford; Oakville, Connecticut.

2009 *Birds*. Cambridge manuals in archaeology. Cambridge University Press, New York.

Seymour, Kevin L.

1989 *Panthera onca*. *Mammalian Species* 340:1-9.

Shigehara, Nobuo, Satoru Onodera, and Moriharu Eto

1997 Sex Determination by Discriminant Analysis and Evaluation of Non-metric Traits in the Dog Skeleton. In *Osteometry of Makah and Coast Salish Dogs*, edited by Susan J. Crockford, pp. 133. Archaeology Press, Burnaby, Canada.

Shipman, Pat

1981 Applications of Scanning Electron Microscopy to Taphonomic Problems. *Annals of the New York Academy of Sciences* 376(1):357-385.

Silver, I. A.

1969 The Ageing of Domestic Animals. In *Science in Archaeology: A Survey of Progress and Research*, edited by Don Brothwell and Eric Higgs, pp. 283-302. Thames and Hudson, New York.

Slaughter, Bob H., Ronald H. Pine, and Nobuko Etoh Pine

1974 Eruption of Cheek Teeth in Insectivora and Carnivora. *Journal of Mammalogy* 55(1):115-125.

Sload, Rebecca

2007 *Radiocarbon Dating of Teotihuacan Mapping Project TE28 Material from Cave Under Pyramid of the Sun, Teotihuacán, México*. FAMSI Report.

Smith, Bruce N, and Samuel Epstein

1971 Two Categories of $^{13}C/^{12}C$ Ratios for Higher Plants. *Plant Physiology* 47(3):380-384.

Smith, C. I., C. M. Nielsen-Marsh, M. M. E. Jans, and M. J. Collins

2007 Bone Diagenesis in the European Holocene I: Patterns and Mechanisms. *Journal of Archaeological Science* 34(9):1485-1493.

Smith, Jonathan Z.

1980 The Bare Facts of Ritual. *History of Religions* 20(1/2):112-127.

1987a The Domestication of Sacrifice. In *Violent Origins: Walter Burkert, René Girard and Jonathan Z. Smith on Ritual Killing and Cultural Formation*, edited by Robert Hamerton-Kelly, pp. 191-205. Stanford University Press, Stanford, California.

1987b *To Take Place: Toward Theory in Ritual*. Chicago studies in the history of Judaism. University of Chicago Press, Chicago.

1998 Religion, Religions, Religious. In *Critical Terms for Religious Studies*, edited by Mark C. Taylor, Francis Schüssler God Fiorenza, Gordon D. God Kaufman, and Margaret R. Miles, pp. 269-284. University of Chicago Press, Chicago.

Smith, Robert Eliot

1987c *A Ceramic Sequence from the Pyramid of the Sun, Teotihuacan, Mexico*. Papers of the Peabody Museum of Archaeology and Ethnography, Vol. 75. Peabody Museum of Archaeology and Ethnology, Cambridge, Massachusetts.

Somerville, Andrew D., Mikael Fauvelle, and Andrew W. Froehle

2013 Applying New Approaches to Modeling Diet and Status: Isotopic Evidence for Commoner Resiliency and Elite Variability in the Classic Maya Lowlands. *Journal of Archaeological Science* 40(3):1539-1553.

Somerville, Andrew D., Ben A. Nelson, and Kelly J. Knudson

2010 Isotopic Investigation of Pre-Hispanic Macaw Breeding in Northwest Mexico. *Journal of Anthropological Archaeology* 29:125-135.

Somerville, Andrew, Nawa Sugiyama, and Margaret Schoeninger

2014 *An Isotopic Investigation of Lagomorph Management and Breeding at Teotihuacan, Mexico*. Paper presented at 79th Annual Society for American Archaeology Meeting, Austin, Texas, April 23-27, 2014.

Sowls, Lyle K.

1957 Reproduction in the Audubon Cottontail in Arizona. *Journal of Mammalogy* 38(2):234-243.

Spence, Michael W, and Luis Manuel Gamboa Cabezas

1999 Mortuary Practices and Social Adaptation in the Tlailotlacan Enclave. In *Prácticas Funerarias en la Ciudad de los Dioses: Los Enterramientos Humanos de la Antigua Teotihuacan*, edited by Linda R. Manzanilla and Carlos Serrano Sánchez, pp. 173-201. Insituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México, México, D.F.

Spence, Michael W., and Grégory Pereira

2007 The Human Skeletal Remains of the Moon Pyramid, Teotihuacan. *Ancient Mesoamerica* 18:147-157.

Šprajc, Ivan

2000 Astronomical Alignments at Teotihuacan, Mexico. *Latin American Antiquity* 11(4):403-415.

Stander, P.E.

1997 Field Age Determination of Leopards by Tooth Wear. *African Journal of Ecology* 35:156-161.

Starbuck, David R.

1975 *Man-Animal Relationships in Pre-Columbian Central Mexico*. Ph.D. dissertation, Yale University, New Haven. Universtiy Microfilms, Ann Arbor.

1987 Faunal Evidence for the Teotihuacan Subsistence Base. In *Teotihuacan, Nuevos Datos, Nuevas Síntesis, Nuevos Problemas*, edited by Emily McClung de Tapia and Evelyn Childs Rattray, pp. 75-90. Universidad Nacional Autónoma de México, México, D.F.

Steenberg, Judie

1981 Captive Breeding of American Golden Eagles at Topeka Zoo between 1969 and 1976. *International Zoo Yearbook* 21(1):109-115.

Stehlik, Josef

1971 Breeding Jaguars at Ostrava Zoo. *International Zoo Yearbook* 11(1):116-118.

Stone, Andrea Joyce, and Marc Zender

2011 *Reading Maya Art: A Hieroglyphic Guide to Ancient Maya Painting and Sculpture*. Thames & Hudson, New York.

Storey, Rebecca

1992 *Life and Death in the Ancient City of Teotihuacan: A Modern Paleodemographic Synthesis*. The University of Alabama Press, Tuscaloosa, Alabama.

Stross, Brian

1998 Seven Ingredients in Mesoamerican Ensoulment: Dedication and Termination in Tenejapa. In *The Sowing and the Dawning: Termination, Dedication, and Transformation in the Archaeological and Ethnographic Record of Mesoamerica*, edited by Shirley Boteler Mock, pp. 31-39. University of New Mexico Press, Albuquerque.

Stuart-Williams, Hilary Le Q., Henry P. Schwarcz, Christine D. White, and Michael W. Spence

1996 The Isotopic Composition and Diagenesis of Human Bone from Teotihuacan and Oaxaca, Mexico. *Palaeogeography, Palaeoclimatology, Palaeoecology* 126:1-14.

Stuart, David

1997 The Hills are Alive: Sacred Mountains in the Maya Cosmos. *Symbols* Spring:15-17.

1998 "The Fire Enters His House": Architecture and Ritual in Classic Maya Texts. In *Function and Meaning in Classic Maya Architecture*, edited by Stephen D. Houston, pp. 373-425. Dumarton Oaks Research Library and Collection, Washington, D.C.

2000 “The Arrival of Strangers”: Teotihuacan and Tollan in Classic Maya History. In *Mesoamerica’s Classic Heritage: From Teotihuacan to the Aztecs*, edited by Davíd Carrasco, Lindsay Jones, and Scott Sessions, pp. 465-514. University Press of Colorado, Boulder, Colorado.

Sugiyama, Nawa

2013a Animals that Reside in the Sacred Mountain and Empowered Monuments at Teotihuacan. In *Constructing, Deconstructing, and Reconstructing Social Identity- 2,000 years of Monumentality in Teotihuacan and Cholula, Mexico-*, edited by Saburo Sugiyama, Shigeru Kabata, Tomoko Taniguchi, and Etsuko Niwa, pp. 41-49. Cultural Symbiosis Research Institute, Aichi Prefectural University, Aichi [Japan].

Sugiyama, Nawa, and William Fash

2009 *Reinterpreting the Copan Felines: Reconstructing the "Jaguar Stew" Assemblage by Altar Q*. Paper presented at 74th Annual Society of American Archaeology Conference, Atlanta, Georgia, , April 22-26, 2009.

Sugiyama, Nawa, and Saburo Sugiyama

2007 *From Dedication Burials to Murals: Re-Interpreting the Teotihuacan Animal Imagery*. Paper presented at 72nd Annual Society for American Archaeology Conference, Austin, Texas, April 25-29, 2007.

Sugiyama, Nawa, Saburo Sugiyama, and Alejandro Sarabia G.

2013a Inside the Sun Pyramid at Teotihuacan, Mexico: 2008-2011 Excavations and Preliminary Results. *Latin American Antiquity* 24(4):403-432.

Sugiyama, Nawa, Raúl Valadez Azúa, and Bernardo Rodríguez

2014 *Faunal Acquisition, Maintenance and Consumption: How the Teotihuacanos Got Their Meat*. Paper presented at 79th Annual Society for American Archaeology Meeting, Austin, Texas, April 23-27, 2014.

Sugiyama, Saburo

1989 Burials Dedicated to the Old Temple of Quetzalcoatl at Teotihuacan, Mexico. *American Antiquity* 54(1):85-106.

1998a Cronología de Sucesos Ocurridos en el Templo de Quetzalcóatl, Teotihuacán. In *Los Ritmos de Cambio en Teotihuacán*, edited by Rosa Brambila and Rubén Cabrera, pp. 167-184. Instituto Nacional de Antropología e Historia, México, D.F.

1998b Termination Programs and Prehistoric Looting at the Feathered Serpent Pyramid in Teotihuacan, Mexico. In *The Sowing and the Dawning: Termination, Dedication, and Transformation in the Archaeological and Ethnographic Record of Mesoamerica*, edited by Shirley Boteler Mock, pp. 147-164. University of New Mexico Press, Albuquerque.

2004 *Voyage to the Center of the Moon Pyramid: Recent Discoveries in Teotihuacan*. Arizona State University and Instituto Nacional de Antropología e Historia, México, D.F.

2005 *Human Sacrifice, Militarism, and Rulership: Materialization of State Ideology at the Feathered Serpent Pyramid, Teotihuacan*. Cambridge University Press, Cambridge [England].

2010 Teotihuacan City Layout as a Cosmogram: Preliminary Results of the 2007 Measurement Unit Study. In *The Archaeology of Measurement: Comprehending Heaven, Earth and Time in Ancient Societies*, edited by Iain Morley and Colin Renfrew, pp. 130-149. Cambridge University Press, New York.

2011 Interactions Between the Living and the Dead at Major Monuments in Teotihuacan. In *Living with the Dead: Mortuary Ritual in Mesoamerica*, edited by James L. Fitzsimmons and Izumi Shimada, pp. 161-202. The University of Arizona Press, Tucson.

2013b Creation and Transformation of Monuments in the Ancient City of Teotihuacan. In *Constructing, Deconstructing, and Reconstructing Social Identity- 2,000 years of Monumentality in Teotihuacan and Cholula, Mexico-*, edited by Saburo Sugiyama, Shigeru Kabata, Tomoko Taniguchi, and Etsuko Niwa, pp. 1-10. Cultural Symbiosis Research Institute, Aichi Prefectural University, Aichi [Japan].

Sugiyama, Saburo, and Rubén Cabrera Castro

2007 The Moon Pyramid Project and the Teotihuacan State Polity. *Ancient Mesoamerica* 18:109-125.

Sugiyama, Saburo, Shigeru Kabata, Tomoko Taniguchi, and Etsuko Niwa, eds.

2013b *Constructing, Deconstructing, and Reconstructing Social Identity- 2,000 years of Monumentality in Teotihuacan and Cholula, Mexico-*. Cultural Symbiosis Research Institute, Aichi Prefectural University, Aichi [Japan].

Sugiyama, Saburo, and Leonardo López Luján

2006a *Sacrificios de Consagración en la Pirámide de la Luna*. Instituo Nacional de Antropología e Historia, Museo de Templo Mayor, Arizona State University, México, D.F.

2006b Simbolismo y Función de los Entierros Dedicatorios de la Pirámide de la Luna en Teotihuacan. In *Arqueología e Historia del Centro de México: Homenaje a Eduardo Matos Moctezuma*, edited by Leonardo López Luján, Davíd Carrasco, and Lourdes Cué, pp. 131-151. Instituto Nacional de Antropología e Historia, México, D.F.

2007 Dedicatory Burial/Offering Complexes at the Moon Pyramid, Teotihuacan: A Preliminary Report of 1998-2004 Exploration. *Ancient Mesoamerica* 18:127-146.

Sullivan, Kristin S.

2006 Specialized Production of San Martín Orange Ware at Teotihuacan, Mexico. *Latin American Antiquity* 17(1):23-53.

Szuter, Christine

2000 Gender and Animals: Hunting Technology, Ritual, and Subsistence in the Greater Southwest. In *Women & Men in the Prehispanic Southwest: Labor, Power & Prestige*, 1st edition, edited by Patricia L. Crown, pp. 197-220. School of American Research Press; James Currey, Santa Fe: Oxford.

Tambiah, Stanley J.

1969 Animals are Good to Think and Good to Prohibit. *Ethnology* 8(4):423-459.

1985 *Culture, Thought, and Social Action : An Anthropological Perspective*. Harvard University Press, Cambridge, Mass.

Taube, Karl A.

1986 The Teotihuacan Cave of Origin: The Iconography and Architecture of Emergence Mythology in Mesoamerica and the American Southwest. *RES: Anthropology and Aesthetics* 12:51-82.

1992 The Iconography of Mirrors at Teotihuacan. In *Art, Ideology, and the City of Teotihuacan : A Symposium at Dumbarton Oaks, 8th and 9th October 1988*, edited by Janet

Catherine Berlo, pp. 169-204. Dumbarton Oaks Research Library and Collection, Washington, D.C.

Tieszen, Larry L., and Tim Fagre

1993 Effect of Diet Quality and Composition on the Isotopic Composition of Respiratory CO2, Bone Collagen, Bioapatite, and Soft Tissue. In *Prehistoric Human Bone: Archaeology at the Molecular Level*, edited by Joseph B. Lambert and Gisela Grupe, pp. 121-155. Springer-Verlag, Berlin; New York.

Tilley, Christopher Y.

1994 *A Phenomenology of Landscape: Places, Paths, and Monuments*. Explorations in Anthropology. Berg, Oxford; Providence, Rode Island.

Tobriner, Stephen

1972 The Fertile Mountain: An Investigation of Cerro Gordo's Importance to the Town Plan and Iconography of Teotihuacan. In *Teotihuacán: XI Mesa Redonda*, edited by Alberto Ruz Lhuillier, pp. 103-115. Sociedad Mexicana de Antropología, México, D.F.

Tokovinine, Alexandre author

2013 *Place and Identity in Classic Maya Narratives*. Studies in Pre-Columbian Art and Archaeology, Vol. 37. Dumbarton Oaks Research Library and Collection, Washington, DC.

Tomek, Teresa, and Bocheński

2000 *The Comparative Osteology of European Corvids (Aves: Corvidae), with a Key to the Identification of their Skeletal Elements*. Wydawnictwa Instytutu Systematyki Ewolucji Zwierzat PAN, Kraków [Poland].

Torres-Estévez, M. Fabiola

In PressLa Fauna y el Patrón de Aprovechamiento en Dos Conjuntos del Barrio Antiguo de La Ventilla: Frente 2 y Frente 5. In *El Barrio Teotihuacano de La Ventilla*, edited by Jaime Delgado and Rubén Cabrera, México, D.F.

Townsend, Richard Fraser

1982 Pyramid and Sacred Mountain. *Annals of the New York Academy of Sciences* 385(1):37-62.

Turner, Victor Witter

1986 *The Anthropology of Performance*. Preface by Richard Schechner. PAJ Publications, New York.

Ulloa, Astrid, ed.

2002 *Rostros Culturales de la Fauna: Las Relaciones Entre los Humanos y los Animales en el Contexto Colombiano*. Instituto Columbiano de Antropología e Historia, Fundación Natural, Colombia.

Urton, Gary

1985 *Animal Myths and Metaphors in South America*. University of Utah Press, Salt Lake City.

Vaillant, George C.

1932 Stratigraphical Research in Central Mexico. *Proceedings of the National Academy of Sciences of the United States of America* 18(7):487-490.

1938 A Correlation of Archaeological and Historical Sequences in the Valley of Mexico. *American Anthropologist* 40(4):535-573.

Valadez Azúa, Raúl

1992 *Impacto del Recurso Faunistico en la Sociedad Teotihuacana*. Unpublished Ph.D Dissertation, Ciencias, Universidad Nacional Autónoma de Mexico, México, D.F.

1993 Microfósiles Faunísticos. In *Anatomía de un Conjunto Residencial Teotihuacano en Oztoyahualco*, edited by Linda Manzanilla, pp. 729-831. Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México, México, D.F.

2003 *La Domesticación Animal*. Universidad Naciona Autónoma de México, Instituto de Investigaciones Antropológicas, México, D.F.

In press Monos y Jaguares en el Universo Prehispánico. In *Los Artistas al Rescate*, edited by. CONACYT, México, D.F.

Valadez Azúa, Raúl, Alicia Blanco, and Bernardo Rodríguez Galicia

2008 El Coyote (*Canis latrans*) Dentro del Universo Mesoamericano. *AMMVEPE* 19(1):9-21.

Valadez Azúa, Raúl, Bernardo Rodríguez Galicia, Rubén Cabrera Castro, George Cowgill, and Saburo Sugiyama

2002a Híbridos de Lobos y Perros (Tercer acto): Hallazgos en la Pirámide de Quetzalcóatl de la Antigua Ciudad de Teotihuacan (Primeros de dos partes). *AMMVEPE* 13(5):165-176.

2002b Híbridos de Lobos y Perros (Tercer acto): Hallazgos en la Pirámide de Quetzalcóatl de la Antigua Ciudad de Teotihuacan (Segunda y última de dos partes). *AMMVEPE* 13(6):219-231.

Valadez Azúa, Raúl, Bernardo Rodríguez Galicia, Linda Manzanilla, and Samuel Tejeda

2006 Dog-Wolf Hybrid Biotype Recostruction from the Archaeological City of Teotihuacan in Prehispanic Central Mexico. In *Dogs and People in Social, Working, Economic or Symbolic Interaction*, edited by Lynn M. Snyder and Elizabeth A. Moore, pp. 120-130. Oxbow Books, Oxford.

Valadez Azúa, Raúl, Bernardo Rodríguez Galicia, Fernando Viniegra Rodríguez, Katiuska Olmos Juménez, Alicia Blanco Padilla, Samuel Tejeda Vega, and Mario Casas Castillo

2002c Hibridos de Lobos y Perros en Cuevas Teotihuacanas: Crónica de un Descubrimiento. *AMMVEPE* 13(1):6-23.

Valadez, Raúl, Luisa Mainou, Alicia Blanco, Bernardo Rodríguez, Nawa Sugiyama, Gilberto Pérez, and Fabiola Torres

2008 *Remineralización y Bio-Consolidación: Una Nueva Técnica de Recuperación Osea. La Pirámide de la Luna, Un Caso de Estudio*. Paper presented at Institutuo de Investigaciones Antroplógicas, Universidad Nacional Autónoma de México, August, 2008.

Valadez, Susana Eger

1996 Wolf Power and Interspecies Communication in Huichol Shamanism. In *People of the Peyote : Huichol Indian History, Religion, and Survival*, 1st edition, edited by Stacy B. Schaefer and Peter T. Furst, pp. 267-305. University of New Mexico Press, Albuquerque.

Valkenburgh, Blaire Van, and Tyson Sacco

2002 Sexual Dimorphism, Social Behavior and Intrasexual Competition in Large Pleistocene Carnivores. *Jounal of Vertebrate Paleontology* 22(1):164-169.

van der Merwe, Nikolaas J.

1982 Carbon Isotopes, Photosynthesis, and Archaeology: Different Pathways of Photosynthesis Cause Characteristic Changes in Carbon Isotope Ratios that Make Possible the Study of Prehistoric Human Diets. *American Scientist* 70(6):596-606.

van der Merwe, Nikolaas J., and Donald H. Avery

1987 Science and Magic in African Technology: Traditional Iron Smelting in Malawi. *Africa: Journal of the International African Institute* 57(2):143-172.

VanPool, Christine S.

2009 The Signs of the Sacred: Identifying Shamans Using Archaeological Evidence. *Journal of Anthropological Archaeology* 28:177-190.

Velázquez Castro, Adrián

2000 *El Simbolismo de los Objetos de Concha Encontrados en las Ofrendas del Templo Mayor de Tenochtitlán*. Colección Cientifica Vol. 403. Instituto Nacional de Antropología e Histori, México, D.F.

2007 *La Producción Epecializada de los Objetos de Concha del Templo Mayor de Tenochtitlan*. Colección Científica, Vol. 519. Instituto Nacional de Antropología e Historia, México, D.F.

2010 Arqueología Experimental en Conchas de Moluscos. In *Ecos del Pasado: Los Moluscos Arqueológicos de México*, edited by Lourdes Suárez Diez and Adrián Velázquez Castro, pp. 67-78. Colección Científica, Vol. 572. Instituto Nacional de Antropología e Historia, México, D.F.

Virginia, RossA, and C. C. Delwiche

1982 Natural 15N Abundance of Presumed N2-Fixing and Non-N2-Fixing Plants from Selected Ecosystems. *Oecologia* 54(3):317-325.

Viveiros de Castro, Eduardo

1998 Cosmological Deixis and Amerindian Perspectivism. *The Journal of the Royal Anthropological Institute* 4(3):469-488.

2012 *Cosmological Perspectivism in Amazonia and Elsewhere*. Masterclass Series 1. HAU Network of Ethnographic Theory, Manchester.

Vogt, Evon Z.

1981 Some Aspects of the Sacred Geography of Highland Chiapas. In *Mesoamerican Sites and World-Views: A Conference at Dumbarton Oaks, October 16th and 17th, 1976*, edited by Elizabeth P. Benson, pp. 119-138. Dumbarton Oaks Research Library and Collections, Trustees for Harvard University, Washington, D.C.

1983 Ancient and Contemporary Maya Settlement Patterns: A New Look from the Chiapas Highlands. In *Prehistoric Settlement Patterns: Essays in Honor of Gordon R. Willey*, 1st edition, edited by Evon Zartman Vogt and Richard M. Leventhal, pp. 89-114. University of New Mexico Press; Peabody Museum of Archaeology and Ethnology, Harvard University, Albuquerque; Cambridge, Mass.

1998 Zinacanteco Dedication and Termination Rituals. In *The Sowing and the Dawning: Termination, Dedication, and Transformation in the Archaeological and Ethnographic Record of Mesoamerica*, edited by Shirley Boteler Mock, pp. 21-30. University of New Mexico Press, Albuquerque.

Vogt, Evon Z., and David Stuart

2005 Some Notes on Ritual Caves Among the Ancient and Modern Maya. In *In the Maw of the Earth Monster: Mesoamerican Ritual Cave Use*, edited by James E. Brady and Keith M. Prufer, pp. 155-185. University of Texas Press, Austin.

Von Den Drisch, Angela

1976 *A Guide to the Measurement of Animal Bones from Archaeological Sites*. Peabody Museum of Archaeology and Ethnology, Harvard University, Cambridge, Massachusetts.

Wacquant, Loïc J. D.

1992 Toward a Social Praxeology: The Structure and Logic of Bourdieu's Sociology. In *An Invitation to Reflexive Sociology*, edited by Pierre Bourdieu and Loïc J. D. Wacquant, pp. 1-59. University of Chicago Press, Chicago.

Walker, Karen

2003 An Illustrated Guide to Trunk Vertebrae of Cottonmouth (*Agkistrodon piscivorus*) and Diamondback Rattlesnake (*Crotalus adamanteus*) in Florida. *Bulletin of the Florida Museum of Natural History* 44(1):91-100.

Warinner, Christina, Nelly Robles Garcia, and Noreen Tuross

2013 Maize, Beans and the Floral Isotopic Diversity of Highland Oaxaca, Mexico. *Journal of Archaeological Science* 40(2):868-873.

Warinner, Christina, and Noreen Tuross

2009 Alkaline Cooking and Stable Isotope Tissue-Diet Spacing in Swine: Archaeological Implications. *Journal of Archaeological Science* 36:1690-1697.

Wassenaar, L.I., S.L. Van Wilgenburg, K. Larson, and K.A. Hobson

2009 A Groundwater Isoscape (δD, δ^{18}O) for Mexico. *Journal of Geochemical Exploration* 102:123-136.

Watson, Jeff

2010 *The Golden Eagle*. Yale University Press, New Haven.

Waye, Heather L., and Patrick T. Gregory

1998 Determining the Age of Greater Snakes (*Thamnophis sp.*) by Means of Skeletochronology. *Canadian Journal of Zoology* 76:288-294.

Weiner, Stephen, and Ofer Bar-Yosef

1990 States of Preservation of Bones from Prehistoric Sites in the Near East: A Survey. *Journal of Archaeological Science* 17(2):187-196.

Wheatley, Paul

1971 *The Pivot of the Four Quarters; A Preliminary Enquiry Into the Origins and Character of the Ancient Chinese City*. Aldine Pub. Co., Chicago.

Wheeler, Brian K., and William S. Clark

1995 *A Photographic Guide to North American Raptors*. Academic Press, London; San Diego.

White, Christine D.

2004 Stable Isotopes and the Human-Animal Interface in Maya Biosocial and Environmental Systems. *Archaeofauna* 13:183-198.

White, Christine D., Fred J. Longstaffe, and Kimberley R. Law

2001a Revisiting the Teotihuacan Connection at Altun Ha: Oxygen-isotope Analysis of Tomb F-8/1. *Ancient Mesoamerica* 12:65-72.

White, Christine D., Mary E. D. Pohl, Henry P. Schwarcz, and Fred J. Longstaffe

2001b Isotopic Evidence for Maya Patterns of Deer and Dog Use at Preclassic Colha. *Journal of Archaeological Science* 28:89-107.

White, Christine D., Douglas Price, and Fred J. Longstaffe

2007 Residential Histories of the Human Sacrifices at the Moon Pyramid, Teotihuacan: Evidence from Oxygen and Strontium Isotopes. *Ancient Mesoamerica* 18:159-172.

White, Christine D., and Henry Schwarcz

1989 Ancient Maya Diet: As Inferred from Isotopic and Elemental Analysis of Human Bone. *Journal of Archaeological Science* 16:451-474.

White, Christine D., Henry P. Schwarcz, Mary Pohl, and Fred J. Longstaffe

2004a Feast, Field, and Forest: Deer and Dog Diets at Lagartero, Tikal, and Copán. In *Maya Zooarchaeology: New Directions in Method and Theory*, edited by Kitty F. Emery, pp. 141-158. Costen Institute of Archaeology, University of California, Los Angeles, CA.

White, Christine D., Michael W. Spence, Fred J. Longstaffe, and Kimberley R. Law

2000 Testing the Nature of Teotihuacan Imperialism at Kaminaljuyu Using Phosphate Oxygen-Isotope Ratios. *Journal of Anthropological Research* 56(4):535-558.

White, Christine D., Michael W. Spence, Fred J. Longstaffe, and Hilary Stuart-Williams

2002 Geographic Identities of the Sacrifical Victims from the Feathered Serpent Pyramid, Teotihuacan: Implications for the Nature of State Power. *Latin American Antiquity* 13(2):217-236.

White, Christine D., Michael W. Spence, Hilary Le Q. Stuart-Williams, and Henry P. Schwarcz

1998 Oxygen Isotopes and the Identification of Geographical Origins: The Valley of Oaxaca Versus the Valley of Mexico. *Journal of Archaeological Science* 25:643-655.

White, Christine D., Rebecca Storey, Fred J. Longstaffe, and Michael W. Spence

2004b Immigration, Assimilation, and Status in the Ancient City of Teotihuacan: Stable Isotopic Evidence from Tlajinga 33. *Latin American Antiquity* 15:176-198.

Wilson, Andrew S., Timothy Taylor, Maria Constanza Ceruti, Jose Antonio Chavez, Johan Reinhard, Vaughan Grimes, Wolfram Meier-Augenstein, Larry Cartmell, Ben Stern, Michael P. Richards, Michael Worobey, Ian Barnes, and M. Thomas P. Gilbert

2007 Stable Isotope and DNA Evidence for Ritual Sequences in Inca Child Sacrifice. *Proceedings of the National Academy of Sciences of the United States of America* 104(42):16456-16461.

Wright, Joshua Saint Clair

2006 *The Adoption of Pastoralism in Northeast Asia, Monumental Transformation in the Egiin Gol Valley, Mongolia*. Ph.D. dissertation, Harvard University, Cambridge, Massachusetts. University Microfilms, Ann Arbor.

Wright, Lori E., and Henry P. Schwarcz

1996 Infrared and Isotopic Evidence for Diagenesis of Bone Apatite at Dos Pilas, Guatemala: Palaeodietary Implications. *Journal of Archaeological Science* 23(6):933-944.

Yellen, John E.

1991 Small Mammals: !Kung San Utilization and the Production of Faunal Assemblages. *Journal of Anthropological Archaeology* 10(1):1-26.

Young, Stanley Paul, and Edward Alphonso Goldman

1944 *The Wolves of North America*. The American Wildlife Institute, Washington, D.C.

1946 *The Puma, Mysterious American Cat*. The American Wildlife Institute, Washington, D.C.

Yuan, Jing, and Rowan K. Flad

2005a New Zooarchaeological Evidence for Changes in Shang Dynasty Animal Sacrifice. *Journal of Anthropological Archaeology* 24:252-270.

2005b Research on Early Horse Domestication in China. In *Equids in Time and Space*, edited by Marjian Mashkour, pp. 124-131. Oxbow, Oxford.

Zingg, Robert M.

2004 *Huichol Mythology*. Ed. J. Fikes, P. Weigand, A. Weigand. The University of Arizona Press, Tucson, Arizona.

Zuidema, Tom R.

1985 The Lion in the City: Royal Symbols of Transition in Cuzco. In *Animal Myths and Metaphors in South America*, edited by Gary Urton, pp. 183-250. University of Utah Press, Salt Lake City.

Appendix A: Summary of previous zooarchaeological studies

Table A.1 Species list and MNI counts from published zooarchaeological data including results of present study.

Species	Common Name	MP	CD	Tet	SP	Teop	MB	BO	Vent	FSP	TMP	PT	Oz	SMC	Total	% MNI
Leporidae		1	0	1	0	0	7	34	0	0	0	0	0	0	43	1
Lepus sp.	Jack rabbits	3	0	0	0	31	1	27	0	0	0	5	20	0	87	3
Lepus californicus	Black-tailed	0	0	0	0	2	0	8	6	0	0	0	0	0	16	1
Lepus callotis	White-sided	0	25	13	3	1	0	23	1	2	33	0	0	0	101	3
Sylvilagus sp.	Cottontails	6	37	21	3	28	1	58	0	5	107	17	38	0	321	11
S. floridanus	Eastern cottontail	2	0	0	0	18	1	16	19	9	0	0	0	0	65	2
S. cunicularius	Mexican cottontail	0	0	0	0	1	1	7	8	2	0	0	0	0	19	1
S. audubonii	Desert cottontail	4	0	0	0	1	1	7	15	1	0	0	0	0	29	1
Romerolaqus diazi	Volcano rabbit	0	0	0	0	1	0	0	1	0	0	0	1	0	3	0
Leporidae Total		*16*	*62*	*35*	*6*	*83*	*12*	*180*	*50*	*19*	*140*	*22*	*59*	*0*	*684*	*24*
*Rodentia**	*Rodents*	*6*	*7*	*12*	*1*	*56*	*8*	*70*	*12*	*7*	*19*	*0*	*13*	*0*	*211*	*7*
Chiroptera																
Artibeus litoratus	Fruit eating bat	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Carnivora	Carnivores	0	0	0	0	0	2	0	0	0	0	0	1	0	3	0
Canidae			0	0	0	0	0	8	0	0	0	0	0	0	8	0
Canis sp.	Canid	1	0	0	0	3	7	132	0	0	0	0	4	0	147	5
Canis familiaris	Dog	0	7	22	2	79	18	124	24	3	27	3	16	1	326	11
Canis lupus	Wolf	30	0	0	1	1	1	0	0	1	0	0	0	0	34	1
Canis latrans	Coyote	1	0	0	0	2	0	0	0	0	0	0	0	0	3	0
Hybrid canids	Hybrid	0	0	0	0	0	0	0	2	11	0	0	0	0	13	0
Urocyon cinereoargenteus	Gray fox	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Mustelidae																
Mustela frenata	Long-tailed weasel	0	0	0	0	2	0	5	1	0	0	0	0	0	8	0

Notes: MP: Moon Pyramid, CD: Ciudadela (Starbuck 1975), SP: Sun Pyramid (Starbuck 1975, Sugiyama et al. 2013a), Tet: Tetitla (Starbuck 1975, Valadez 1992), Teop:Teopancazco (Rodríguez Galicia 2006, 2010, Starbuck 1975), MB: Merchant's Barrio (Starbuck 1975, Valadez 1992), BO: Barrio Oaxaqueño (Espinosa et al. In press, Starbuck 1975, Valadez 1992), Vent: La Ventilla (Torres-Estévez in press), FSP: Feathered Serpent Pyramid (Álvarez and Ocaña 1993; Valadez et al. 2002a,b), TMP: Teotihuacan Mapping Project (T.E.1, 2, 5, 12, 13, 14, 15, 17, 18, 21, 23, 26[a]) (Starbuck 1975), PT: Proyecto Teotihuacan (Starbuck 1975), Oz: Oztoyohualco (Valadez 1992), SMC: Santa Maria Coatlan (Valadez 1992). Species names highlighted in light grey are intrusive, rows highlighted in dark grey are non-local species. *Not defined to species.

Table A.1 Continued

Species	Common Name	MP	CD	Tet	SP	Teop	MB	BO	Vent	FSP	TMP	PT	Oz	SMC	Total	% MNI
Mephitis			0	0	0	0	0	0	1	0	0	0	0	0	1	0
Mephitis macroura	Striped skunk	0	0	0	1	1	0	0	0	0	0	0	0	0	2	0
Spitogale putorius	Spotted skunk	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Felidae		8	0	0	0	1	0	1	1	0	0	0	0	0	11	0
Panthera onca	Jaguar	8	0	0	0	0	0	1	0	0	0	0	1	0	10	0
Puma concolor	Puma	29	0	0	2	1	0	4	1	3	0	0	0	0	40	1
Felis yagouaroundi	Jaguarundi	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Felis wiedii	Margay	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Linx rufus	Lynx	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Felis domesticus		0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Bassariscus astutus	Ring-tailed cat	0	0	0	0	1	0	0	0	1	0	0	0	0	2	0
Procyon lotor	Raccoon	0	0	0	0	1	0	1	0	0	0	0	0	0	2	0
Ateles sp.	Spider monkey	1	0	0	0	1	0	0	0	0	0	0	0	0	2	0
Urus americanus	Black bear	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Carnivora total		*78*	*7*	*22*	*6*	*96*	*29*	*278*	*30*	*19*	*27*	*3*	*23*	*1*	*619*	*21*
Med/Lg Mammals		3	0	0	0	0	17	156	0	0	0	0	7	0	183	6
Artiodactyla	2-toed animals	0	0	0	0	0	1	50	0	0	0	0	6	0	57	2
Odocoileus hemionus	Mule deer	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0
Odocoileus virginianus	White tailed deer	0	13	21	2	17	17	128	45	4	54	2	5	0	308	11
Antilocapra americana	Proghorn	0	0	0	0	2	2	6	2	0	0	0	1	1	14	0
Tayassu tajacu	Collared peccary	0	0	0	0	2	0	0	1	0	0	0	0	0	3	0
Ovis aries	Goat	0	0	0	0	0	0	12	0	0	0	0	0	0	12	0
Bos taurus	Cow	0	0	0	0	0	0	3	0	0	1		0	0	4	0
Sus scrofa	Pig	0	0	0	0	0	0	5	0	0	0	0	0	0	5	0
Equus caballus	Horse	0	0	0	0	0	0	1	0	0	2	0	0	0	3	0
Didelphis virginiana	Common opossum	0	0	0	0	2	0	1	1	0	0	0	0	0	4	0
Dasypus novemcinctus	Nine banded armadillo	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Med/Lg Mammals Total		*3*	*13*	*21*	*2*	*24*	*37*	*362*	*49*	*7*	*57*	*2*	*19*	*1*	*597*	*21*

Table A.1 Continued

Species	Common Name	MP	CD	Tet	SP	Teop	MB	BO	Vent	FSP	TMP	PT	Oz	SMC	Total	% MNI
Aves		6	0	4	0	1	6	21	0	0	4	0	5	0	47	2
Accipitridae	Eagles/hawks	0	0	1	0	0	0	0	1	2	1	0	0	0	5	0
Aquila chrysaetos	Golden Eagle	29	0	0	1	1	0	0	0	1	0	0	0	0	32	1
Buteo sp.	Hawk	5	0	1	0	1	0	0	0	2	0	0	0	0	9	0
Buteo jamaicensis	Red-Tailed Hawk	2	0	0	1	1	0	0	0	0	0	0	0	0	4	0
Buteo magnirostris	Roadside Hawk	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Circus cyaneus	Northern harrier	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pandion haliaetus	Osprey	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Anatidae	Waterfowl	0	10	8	0	29	4	9	11	0	28	4	1	0	104	4
Anas a. acuta	Northern pintail	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Anas platyrhynchos	Mallard	0	0	0	0	0	0	0	6	0	0	0	0	0	6	0
Anas strepedra	Gadwall	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Anser c. caerulescens	Snow goose	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Aythya collaris	Ring-necked duck	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Branta canadensis	Canada Goose	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Cairina moschata	Muscovy duck	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0
Oxyura sp.	Stiff-tailed duck	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Anhinga anhinga	Darters	0	0	0	0	1	0	0	0	0	0	0	0		1	0
Strigidae	Ture owl															
Bubo sp.	Horned Owl	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Bubo virginanus	Horned Owl	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Strix varia	Barred Owl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyto alba	Barn owl	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Cathartes aura	Turkey vulture	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Columbidae		3	0	1	0	0	0	0	1	0	0	0	0	0	5	0
Columbina inca	Inca dove	1	0	0	0	1	0	0	0	0	0	0	0	0	2	0
Leptotila verreauxi	White-tipped dove	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
Zenaida macroura	Mourning dove	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Dendrocopos sp.	Woodpecker	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0

Table A.1 Continued

Species	Common Name	MP	CD	Tet	SP	Teop	MB	BO	Vent	FSP	TMP	PT	Oz	SMC	Total	% MNI
Falconidae		0	0	0	0	1	0	0	1	0	1	0	0	0	3	0
Falco mexicanus	Prairie falcon	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Falco sparverius	American kestrel	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Fringillidae	Finches	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
Galliformes	Fowl															
Colinus virginianus	Northern bobwhite	2	0	0	0	11	0	8	10	0	0	0	0	0	31	1
Cyrtonyx montezumae	Montezuma quail	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Dendrortyx macroura	Wood partiridge	0	0	0	0	1	0	0	0	0	2	0	0	0	3	0
Phasianidae	Pheasants	0	8	5	0	0	0	0	0	0	23	4	0	0	40	1
Meleagris gallopavo	Domesticated turkey	0	2	7	0	60	8	41	20	0	19	3	7	0	167	6
Geococcyx sp.	Roadrunner	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Laridae	Gull	0	0	0	0	2	0	0	1	0	0	0	0	0	3	0
Larus delawarensis	Ring-billed Gull	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Passeriformes	Passerine															
Cardinalis cardinalis	Red cardinal	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Corvus sp.	Crow/raven	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Corvus corax	Northern raven	3	0	0	0	0	0	0	0	0	0	0	1	0	4	0
Icterus pustulatus	Streak-backed oriole	0	0	0	0	0	0	0	0	0	0	0	0	10	10	0
Passerina caerulea	Blue grosbeak	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0
Thryothorus felix	Harpy Wren	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Toxostoma sp.	Thrasher	0	0	0	0	5	0	0	0	0	0	0	0	0	5	0
Podilymbus podiceps	Pied-billed Grebe	0	0	0	0	1	1	0	2	0	0	0	0	0	4	0
Psittacidae	Parrots															
Amazona sp.	Common Parrot	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Rallidae	Rails		0	1	0	1	0	0	0	0	1	0	0	0	3	0
Fulica americana	American coot	0	0	0	0	5	1	0	1	0	0	0	0	0	7	0

Table A.1 Continued

Species	Common Name	MP	CD	Tet	SP	Teop	MB	BO	Vent	FSP	TMP	PT	Oz	SMC	Total	% MNI
Scolopacidae	Sandpipers	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Actitis macularia	Spotted sandpiper	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
Calidris sp.	Sandpipers	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Tringa solitaria	Solitary sandpiper	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Threskiornithidae		0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Eudocimus albus	White ibis	0	0	0	0	0	1	0	0	0	0	0	0		1	0
Trogon mexicanus	Moutain trogon	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Med sized birds	Med bird	0	0	0	0	0	0	6	0	0	0	1	0		7	0
Aves total		*56*	*20*	*30*	*2*	*132*	*24*	*88*	*63*	*6*	*79*	*12*	*14*	*17*	*543*	*19*
Bony Fish		0	0	0	0	25	0	5	0	0	7	0	0	0	37	1
Atherinidae	Old world silverside	0	0	0	0	3	0	0	0	0	0	0	0	0	3	0
Bairdiella ronchus	Ground drummer	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Carangidae	Jacks, etc.	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Caranx sp.	Jacks	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0
Caranx hippos	Crevalle Jack	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0
Centropomus sp.	Snook	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Chaetodipterus sp.	Spadefish	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Clúpeidae	Herrings, sardines	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Lile sp.	sardines		0	0	0	2	0	0	0	0	0	0	0	0	2	0
Cyprinodontidae	Pupfish	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0
Gerreidae	Mojarra		0	0	0	0	0	0	0		0			0	0	0
Diapterus sp.	Mojarra	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Eucinostomus sp.	Mojarra	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Haemulidae	Grunt	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0
Joturus pichardi	Bobo mullet	0	0	0	0	36	0	0	0	0	0	0	0	0	36	1
Lutjanidae	Snappers	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0
Lutjanus sp.	Snapper	0	0	0	0	13	0	0	1	0	0	0	0	0	14	0

Table A.1 Continued

Species	Common Name	MP	CD	Tet	SP	Teop	MB	BO	Vent	FSP	TMP	PT	Oz	SMC	Total	% MNI
Pomacanthidae	Angelfish	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0
Serranidae			0	0	0	0	0	0	0		0			0	0	0
Epinephelus nigritus	Black grouper	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Mycteroperca bonaci	Black grouper	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Sphyraena barracuda	Barracuda	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Siluriformes	Catfish		0	0	0	0	1	0	0	0	0	0	0	0	1	0
Ictalurus sp.	Catfish	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0
Cartilaginous fish																
Carcharinus sp.	Shark	0	0	0	0	1	0	2	0	0	0	0	0	0	3	0
Prionace glauca	Blue shark	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Rajiformes	Skates, rays, stingaray	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Fish total		*0*	*0*	*0*	*0*	*107*	*1*	*9*	*2*	*0*	*7*	*0*	*0*	*0*	*126*	*4*
Amphibian		0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Anaxyrus compactilis	Toad		0	0	0	0	0	0	2	0	0	0	0	0	2	0
Anura	Frog/toad	0	0	0	0	1	0	4	0	0	0	0	0	0	5	0
Lithobates sp.	True fogs		0	0	0	0	0	0	2	0	0	0	0	0	2	0
Scaphiopus sp.	Southern spadefoot toad	0	0	0	0	1	0	0	0	1	0	0	1	0	3	0
Reptile			0	0	0	0	0	1	0	0	0	0	0	0	1	0
Chelonii/Testudines	Turtles	0	1	3	1	0	1	18	0	0	8	1	0	0	33	1
Dermatemys mawii	Meso river turtle	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
Kinosteron sp.		0	0	1	0	2	0	1	2	0	0	0	0	0	6	0
Kinosternon hirtipes	Mexican mud turtle	0	0	0	0	1	0	1	0	0	0	0	0	0	2	0
Rhinoclemmys sp.	Wood turtle	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Terrapene nelsoni	Spotted box turtle	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Trachemys sp.		0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Trachemys scripta	Slider turtle	0	0	0	0	1	0	10	7	0	0	0	0	0	18	1
Crocodylus sp.	Crocodile	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0

Table A.1 Continued

Species	Common Name	MP	CD	Tet	SP	Teop	MB	BO	Vent	FSP	TMP	PT	Oz	SMC	Total	% MNI
Serpentes	Serpent	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crotalus sp.	Rattlesnake	33	0	0	0	1	0	0	0	5	0	0	0	0	39	1
Iguanidae	Iguana	0	0	0	0	0	0	1	1	0	0	0	0	0	2	0
Lacertilia	Lizards	1	0	0	0	0	0	0	0	2	0	0	0	0	3	0
Sceloporus torquatus	Torquate Lizard	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
Pituophis deppei	Mexican pine snake	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Amphibian/Reptiale Total		*34*	*1*	*4*	*1*	*10*	*2*	*38*	*14*	*10*	*8*	*1*	*1*	*0*	*124*	*4*
Other																
Eucidaris thouarsii	Slate Pencil Urchin	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Cardisoma ca. guanhumi	Blue land crab	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Gecarcinus ca. lateralis	Land crab	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0
Other total		*0*	*0*	*0*	*0*	*4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*4*	*0*
Total		**193**	**110**	**124**	**18**	**513**	**113**	**1025**	**220**	**68**	**337**	**40**	**129**	**19**	**2909**	

Appendix B: Comparative Canid Measurements

Table B.1 Measurements of maxillary third and fourth premolar of comparative canids. Data taken from Blanco et al. (2009:Tables 6-14).

Ele #	Specie	Age	Sex	Pm4 Height	Pm4 Width	Pm4 Length	Pm3 Height	Pm3 Width	Pm3 Length
CIB 1	Canis lupus	Adult	Male	13.48	9.59	23.32	6.6	5.95	14.75
CIB 2	Canis lupus	Adult	Female	12.39	8.49	21.45	7.12	5.31	13.76
CIB 3	Canis lupus	Adult	Male	10.16	8.56	23.19	5.08	5.48	15.58
CIB 4	Canis lupus	Adult	Male	12.42	9.81	23.41	5.4	5.98	13.82
CIB 5	Canis lupus	Adult	Male	11.41	9.01	20.93	7.09	5.81	13.68
CIB 6	Canis lupus	Adult	Male	12.69	8.91	23.16	7.76	6.33	14.64
CIB 7	Canis lupus	Adult	Male	12.52	8.62	22.24	7.82	5.85	13.83
CIB 8	Canis lupus	Adult	Male	14.82	9.5	23.19	7.96	6.25	13.91
CIB 9	Canis lupus	Adult	Male	14.17	10.19	24.89	7.5	6.77	15.95
CIB 10	Canis lupus	Adult	Male	12.98	9.91	25.09	4.8	8.5	16.12
ENCB	Canis latrans	Adult	Male	9.45	6.06	17.81	6.19	3.31	10.87
ENCB	Canis latrans	Adult	Female	9.04	6.95	18.47	5.01	3.78	11.71
ENCB	Canis latrans	Adult	Female	9.25	6.18	17.76	5.14	3.74	11.64
ENCB	Canis latrans	Adult	Female	10.07	6.35	18.59	5.28	3.72	11.88
ENCB	Canis latrans	Adult	Female	10.49	6.38	16.31	5.69	3.83	10.56
ENCB	Canis latrans	Adult	Female	10.9	7.02	17.17	6.2	3.91	11.71
ENCB	Canis latrans	Adult	Male	10.74	6.48	18.19	6.27	4.47	12.28
ENCB	Canis latrans	Adult	Male	10.03	6.46	18.52	6.13	3.76	12.21
ENCB	Canis latrans	Adult	Male	10.23	6.65	19.74	5.71	4.1	12.27
DSA-	Canis latrans	Adult	Female	10.43	6.8	19.81	6.36	3.97	12.75
TEO 1	Canis familiaris	Adult	Male	9.1	6.7	15.8	5.7	4.7	10.2
T48485	Canis familiaris	Adult	Male	8.4	6.7	16.1	5.1	4.1	10
TUL 3	Canis familiaris	Adult	Male	8.4	9	15.3	4.9	3.9	10
PP29	Canis familiaris	Adult	Male	10.3	7.4	17.4	6	4.4	10.2
PP31	Canis familiaris	Yng	-998	9.5	7.2	16	5.2	5	9.8
PP8	Canis familiaris	Adult	Female	9.5	7	16	5.2	4	8.5
PDA-99	Canis familiaris	Adult	Male	10.64	6.93	16.92	5.58	4.75	10.24
VEN 1	Canis familiaris	Adult	Male	10.23	6.68	15.99	-	-	-
SIN	Canis familiaris	Adult	Male	9.71	7.1	16.01	5.72	4.28	8.86

Table B.2 Average, standard deviation (Std div) and two standard deviation of the comparative measurements for wolves, coyotes and canids: a) maxillary fourth premolar and b) maxillary third premolar.

a)

	Width			Length		
	Average	Std div	2 std div	Average	Std div	2 std div
Wolf	9.3	0.6	1.2	23.1	1.3	2.6
Coyote	6.5	0.3	0.6	18.2	1.1	2.1
Dog	7.2	0.7	1.4	16.2	0.6	1.2

b)

	Width			Length		
	Average	Std div	2 std div	Average	Std div	2 std div
Wolf	6.2	0.9	1.8	14.6	1.0	1.9
Coyote	3.9	0.3	0.6	11.8	0.7	1.3
Dog	4.4	0.4	0.8	9.7	0.7	1.3

Appendix C: Comparative Bird Measurements

Table C.1 Tarsometatarsus greatest length and proximal width measurements for comparative male and female golden eagles. Data extracted from McKusick (2001:Table 9).

Sex	*Length*	*Prox Width*	*Sex*	*Length*	*Prox Width*	*Sex*	*Length*	*Prox Width*
M	93.7	20.6	M	98.7	21.9	F	104.1	23.8
M	95.3	19.4	M	98.7	21.3	F	103.1	23.3
M	95.6	20.2	M	98.7	20.5	F	102.8	23.4
M	96.2	20.0	M	99.0	20.3	F	102.8	22.3
M	96.2	19.4	M	98.7	19.9	F	102.5	22.5
M	96.9	19.4	M	99.4	19.9	F	102.2	22.1
M	96.5	20.3	M	99.7	19.5	F	102.2	22.4
M	96.5	20.4	M	99.7	20.0	F	102.2	23.5
M	96.8	20.3	M	99.7	21.4	F	102.5	24.1
M	97.2	20.4	M	100.0	21.5	F	101.8	22.5
M	96.2	21.4	M	100.0	22.3	F	101.5	22.3
M	96.5	21.8	M	100.3	21.0	F	101.5	22.5
M	97.2	22.2	M	100.3	20.7	F	101.2	22.6
M	97.5	20.3	M	100.6	20.6	F	101.2	23.5
M	97.5	20.5	M	100.6	20.0	F	101.2	24.1
M	97.5	20.7	M	101.3	21.4	F	100.6	23.0
M	97.5	20.8	M	101.9	20.8	F	100.6	22.0
M	97.8	20.0	M	102.5	21.7	F	99.7	22.3
M	97.8	20.6	M	103.2	20.7	F	99.6	23.2
M	97.8	21.0	M	102.5	20.4	F	99.3	23.2
M	97.8	22.0	M	102.8	19.4	F	99.3	24.1
M	98.1	20.2	M	104.1	21.4	F	98.4	23.7
M	98.1	19.9	F	105.7	23.5	F	98.1	23.6
M	98.1	21.0	F	105.0	23.0	F	97.8	23.3
M	98.4	19.9	F	105.0	22.6	F	98.1	22.7
M	98.4	20.5	F	104.1	22.3	F	95.6	22.2
M	98.4	20.7	F	104.4	22.8	F	96.5	22.0
M	98.4	21.8	F	104.7	23.5	f	101.8	21.9
M	98.4	22.7	F	104.1	23.4	f	100.3	21.1

Note. M:Male, F:Female, f:possible female.

Table C.2 Tarsometatarsus greatest length and proximal width measurements for archaeological samples and its sex designation.

Element #	*Sex*	*Length*	*Prox Width*
1983	M	98.8	20.56
2010	M	101.5	21.1
2047	UNID	102.6	-
1961.1	F	106.5	23.15
2200	UNID	99.7	-
1962	UNID	104	-
2239	F	104.5	23.3
144	UNID	98.5	-
2214, 1919	M	100.35	20.975
2226	F	99.5	23.6
2246	UNID	98.6	22
2070	M	96.4	21.7
2192	UNID	102.4	-
283.1	UNID	87.6	23.01
309.1	F	99.25	23.55
121	M	98	21
165.1	UNID	100.5	-
2193	M	102.4	21.07
196	F	105	25
120	M	94.7	19.7
PPS211.1	M	94.25	20.9
2069.1	M	99.5	21.33

Appendix D: Felid data forms

Felid

No de Elemento:	1991.1	Class:	Mammalia	Age:	Juvenile
Entierro:	E.6	Orden:	Carnivora	Sex:	UnID
Localidad:	T.12, E.6	Familia:	Felidae		
Asociacion:		Genus:	Felis		
Capa:	LXXXI	Specie:	sp.		

Notes: Craneo parcialmente destruido. Individuo muy joven. Dientes diciduos, solo incisivos permanentes entre 6-8 meses de edad. Felinos tienen bebes entre abril y sept, por eso este ritual occurio entre sept y abril durante la temporada seca.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: Si

Notas

Que tipo? 2

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	0			Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?: Si

Notas:

Desgaste:

Medidas dentales (mandibulas):

Felid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.				Der.	0		
Pm/3	Izq.	0			Der.	0		
Pm/4	Izq.	0			Der.	0		
M/1	Izq.	0			Der.	0		

Dientes de leche? Si

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	6	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:	85.6	88.8	Fusion de sinfisis:	Unfused
Long. maxima:	82.6	85.1	Nivel de fusion:	Unfused
Altura rama mand:	39.3	0		
Ancho rama mand:	27.6	27.7		
Altura rama mand (Pm4):	0	18.9		

Felid

No de Elemento:	2043	Class:	Mammalia	Age:	Infant
Entierro:	E.6	Orden:	Carnivora	Sex:	UnID
Localidad:	T.12, E.6	Familia:	Felidae		
Asociacion:	N1-31	Genus:	Panthera		
Capa:	LXXXI	Specie:	onca		

Notes: Craneo de felino fragmentado. MI2 superior izquierdo maxilar se tomo de muestra para analisis. Los dientes permanetes no se pudieron medir debido a lo fragmentado de su condicion. El craneo de los huesos del neurocraneo.

Modificaciones del superficie

Mod Presente?	False	No de patologias:	
No de huellas de corte pr		Ubicacion pat:	
Ubicacion de huellas:		# otras mod:	
		Ubicacion:	

Consolidantes

Uso consolidante?: Notas

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	0			Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?: Si

Notas: C, M1 en erupcion y fr

Desgaste:

Medidas dentales (mandibulas):

Felid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.				Der.	0		
Pm/3	Izq.	0			Der.	0		
Pm/4	Izq.	0			Der.	0		
M/1	Izq.	0			Der.	0		

Dientes de leche? Si

Notas: I2, I3, C, y M1 en erupcion y fragmentado.

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	Unfused
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	Unfused

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	Unfused
Long. maxima:	0	0	Nivel de fusion:	Unfused
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	18.8	19.5		

Felid

No de Elemento:	2068	Class:	Mammalia	Age:	Juvenile
Entierro:	E.6	Orden:	Carnivora	Sex:	UnID
Localidad:	T.12, E.6	Familia:	Felidae		
Asociacion:	N4-34	Genus:	Puma		
Capa:	LXXXI	Specie:	concolor		

Notes: Craneo de felino fragmentado. Diente Pm4 de maxilar derecho se tomo para muestra de analisis quimico.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr	2	# otras mod:	
Ubicacion de huellas:	mandibula	Ubicacion:	

Consolidantes

Uso consolidante?: Si

Notas

Que tipo? 2

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	3.9	4.1	4.1
I3/	Izq.	0			Der.	7.4	5.4	5.5
Cx/	Izq.	23.3	-11.4	-8.5	Der.	-22.9	-9.7	-8.6
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	8.9	7	13.4	Der.	8.7	7.4	13.7
Pm4/	Izq.	11.4	8	20.7	Der.	10.9	10.3	21.1
M1/	Izq.	0			Der.	0		

Dientes de leche?: Si

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	20	9.9	8.4	Der.	18.9	10.1	-8.1
Pm/3	Izq.	5.7	5.8	10.5	Der.	7	5.6	10.3
Pm/4	Izq.	0			Der.	-998	-998	13.3
M/1	Izq.	11	7.9	15.3	Der.	13.3	6.6	14.6

Dientes de leche? Si

Notas: Pm4 en erupcion.

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	Unfused
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	Barely Fu

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:	-998	-998	Fusion de sinfisis:	Unfused
Long. maxima:	-998	-998	Nivel de fusion:	Unfused
Altura rama mand:	-998	-998		
Ancho rama mand:	-998	-998		
Altura rama mand (Pm4):	-998	18.3		

Felid

No de Elemento:	2071	Class:	Mammalia	Age:	Infant
Entierro:	E.6	Orden:	Carnivora	Sex:	UnID
Localidad:	T.12, E.6	Familia:	Felidae		
Asociacion:	N4-33	Genus:	Panthera		
Capa:	LXXXI	Specie:	onca		

Notes: Craneo de felino. Presenta marcas de corte en la mandibula, ademas de no tener los huesos del nuerocraneo. Tampoco hay dientes permanentes.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr	20	# otras mod:	
Ubicacion de huellas:	craneo y mandibula	Ubicacion:	

Consolidantes

Uso consolidante?:	Si	Notas	
Que tipo?	2		

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.				Der.			
I2/	Izq.				Der.			
I3/	Izq.				Der.			
Cx/	Izq.				Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.				Der.	0		
Pm4/	Izq.				Der.			
M1/	Izq.				Der.	0		

Dientes de leche?: Si

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	Izq.				Der.		
I/2	Izq.				Der.		
I/3	Izq.				Der.		
C/x	Izq.				Der.		
Pm/3	Izq.				Der.		
Pm/4	Izq.				Der.		
M/1	Izq.				Der.		

Dientes de leche? Si

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	Unfused
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	Unfused

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:	83.2	0	Fusion de sinfisis:	Unfused
Long. maxima:	85.5	0	Nivel de fusion:	Unfused
Altura rama mand:	35.5	0		
Ancho rama mand:	15.6	0		
Altura rama mand (Pm4):	18.5	0		

Felid

No de Elemento:	2195	Class:	Mammalia	Age:	Infant
Entierro:	E.6	Orden:	Carnivora	Sex:	UnID
Localidad:	T.12, E.6	Familia:	Felidae		
Asociacion:		Genus:	Panthera		
Capa:	LXXXI	Specie:	onca		

Notes: Craneo de felino muy fragmentado sin huesos de neurocraneo y con huellas de corte. Se tomo un incisivo deciduo inferior derecho para muestra de analisis. Dientes deciduas y permanentes por eruptar.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr	20	# otras mod:	
Ubicacion de huellas:	Craneo	Ubicacion:	

Consolidantes

Uso consolidante?: Si — Notas:

Que tipo? 2

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	3.7	3.6	2.7	Der.	3.8	3.7	2.7
I2/	Izq.	4	3.9	2.9	Der.	3.8	3.9	2.9
I3/	Izq.	6.9	5.9	5.4	Der.	7.4	5.7	5.5
Cx/	Izq.	-17.5	-10.6	-8.7	Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	9.4	-7.6	15.8	Der.	0		
Pm4/	Izq.	11.1	10.9	21.4	Der.	10.5	11.5	19.7
M1/	Izq.	2.3	6.1	3.6	Der.	0		

Dientes de leche?: Si

Notas: C y Pm3 en erupcion.

Desgaste:

Medidas dentales (mandibulas):

Felid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	1.4	2.3	2.1	Der.	3.5	3.3	3.1
I/2	Izq.	4.1	3.3	3.1	Der.	4.1	4.3	4.3
I/3	Izq.	4.7	4.1	4.1	Der.	6.4	4.6	4
C/x	Izq.	-19.6	-8.5	-7.4	Der.	-20.4	-11	-8.1
Pm/3	Izq.	-7.5	-5.8	-11.5	Der.	7.3	5.9	11.6
Pm/4	Izq.	9.9	7.7	15	Der.	10.6	7.8	15
M/1	Izq.	13.8	7.7	16.2	Der.	12.6	7.7	-15.7

Dientes de leche? Si

Notas: Todas de mand der pos estan eruptando

Desgaste: I1 izq dice que

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	Unfused
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	99

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	Unfused
Long. maxima:	0	0	Nivel de fusion:	Unfused
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	2223	Class:	Mammalia	Age:	Juvenile
Entierro:	E.6	Orden:	Carnivora	Sex:	UnID
Localidad:	T.12, E.6	Familia:	Felidae		
Asociacion:	N3-33	Genus:	Panthera		
Capa:	LXXXI	Specie:	onca		

Notes: Solo esta presente el craneo y mandibula con sus dentadura. Se ubicaron huellas de corte en el maxilar izquierdo y la mandibula derecha. El canino derecho inferior se tomo para muestra de analisis quimico. La edad es de un individuo juvenil temprano y se determino a partir de los dientes.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr	8	# otras mod:	
Ubicacion de huellas:	Craneo y mandibula	Ubicacion:	

Consolidantes

Uso consolidante?: Si

Que tipo? 2

Notas

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.2	2.8	3.7	Der.	0		
I2/	Izq.	3.7	2.9	3.6	Der.	4.5	3.6	4.1
I3/	Izq.	8.1	5.7	4.7	Der.	8.4	5.6	5.6
Cx/	Izq.	-20.8	11.3		Der.	-25.2	-9.5	-7.5
Pm2/	Izq.	3.8	3.5	5.2	Der.	3.1	3.6	5.4
Pm3/	Izq.	10.3	7.8	-14	Der.	-11.7	-6.9	-14.5
Pm4/	Izq.	12.2	10.6	20.8	Der.	11.8	10.7	20.7
M1/	Izq.	3.6	5.2	2.9	Der.	3.3	4.7	3

Dientes de leche?: Si

Notas:

Desgaste:

Felid

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	-20.6	-998	-998	Der.	20.5	-9.1	9.4
Pm/3	Izq.	6.8		-12.9	Der.	-8.2	6.2	13
Pm/4	Izq.	11.5	6.9	14.9	Der.	-10.8	6.4	15.1
M/1	Izq.	-10.5	-7	-998	Der.	12.3	-6.7	-16.1

Dientes de leche? Si

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	2228	Class:	Mammalia	Age:	Juvenile
Entierro:	E.6	Orden:	Carnivora	Sex:	UnID
Localidad:	T.12, E.6	Familia:	Felidae		
Asociacion:	N4-35	Genus:	Puma		
Capa:	LXXXI	Specie:	concolor		

Notes: Craneo de felino en pesimo estado de conservacion, solo se recuperaron pequenos fragmentos. Se tomo el canino inferior izquierdo permanente para el analisis quimico. En uno de los fragmentos de la mandibula derecha se ubican huellas de corte. Juvenile avanzado de aproximadamente 1 ano de edad.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr	3	# otras mod:	
Ubicacion de huellas:	mandibula	Ubicacion:	

Consolidantes

Uso consolidante?: Si

Que tipo? 2

Notas

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.4	3.1	3.3	Der.	0		
I2/	Izq.	4	3.2	3.9	Der.	3.3	2.7	2.7
I3/	Izq.	8	4.9	5.2	Der.	7.5	4.8	4.6
Cx/	Izq.	25.8	-10.8		Der.	-10.9	-8.1	
Pm2/	Izq.	3.4	3.4	3.8	Der.	3.4	3.3	3.7
Pm3/	Izq.	10.8	7.9	-14	Der.	11.5	8.2	14.9
Pm4/	Izq.	11.4	10.9	19.5	Der.	12.8	10.7	20.2
M1/	Izq.	0			Der.	3.1	6.6	3.1

Dientes de leche?: Si

Notas:

Desgaste:

Felid

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	25.2	-11.1		Der.	20.8	10.7	
Pm/3	Izq.	0	6.3		Der.	8.2	6	12.8
Pm/4	Izq.	0	-7.2		Der.	11.5	7.5	14.5
M/1	Izq.	12.5	8	15.9	Der.	13.4	7.5	15.8

Dientes de leche? Si

Notas: C en erupcion

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	UnID
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.
Long de la mand:		0
Long. maxima:	0	0
Altura rama mand:	0	0
Ancho rama mand:	0	0
Altura rama mand (Pm4):	0	0

Fusion de sinfisis: Unfused

Nivel de fusion:

Felid

No de Elemento:	2245	Class:	Mammalia	Age:	Infant
Entierro:	E.6	Orden:	Carnivora	Sex:	UnID
Localidad:	T.12, E.6	Familia:	Felidae		
Asociacion:	N2-35	Genus:	Puma		
Capa:	LXXXI	Specie:	concolor		

Notes: Craneo incompleto y fragmentado pero sin neurocraneo. Dientes completos (permanentes y deciduales). Huesos de tarsometatarso de un ave asociado al elemento 2245.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: Si — Notas

Que tipo? 2

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.6	3.7	3.4	Der.	4.8	4.3	4
I2/	Izq.	3.6	3.1	2.9	Der.	4.8	4.3	3.5
I3/	Izq.	8	5.4	4.8	Der.	8	5.5	4.8
Cx/	Izq.	19	6.7	10.4	Der.	16.3	7.7	9.4
Pm2/	Izq.	-998	-998	-998	Der.	0		
Pm3/	Izq.	8.9	7.3	14.2	Der.	9.1	7	14.3
Pm4/	Izq.	11	10.2	21.6	Der.	11.3	-998	21.8
M1/	Izq.	0			Der.	0		

Dientes de leche?: Si

Notas: C, Pm2, Pm3, Pm4, M1

Desgaste:

Medidas dentales (mandibulas):

Felid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	3.6	2.7	2.3	Der.	3.8	2.8	2.1
I/2	Izq.	0			Der.	4.3	3.2	2.8
I/3	Izq.	0			Der.	4.7	4.2	4.2
C/x	Izq.	20.4	8	10.1	Der.	17.3	7.2	10.7
Pm/3	Izq.	0			Der.	0		
Pm/4	Izq.	10.1	7.6	14.5	Der.	9.2	7.4	14.1
M/1	Izq.	13.8	7.6	16.6	Der.	13.9	7.5	16.6

Dientes de leche? Si

Notas: C, Pm3, Pm4, M erupcion

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	N4.31	Class:	Mammalia	Age:	Juvenile
Entierro:	E.6	Orden:	Carnivora	Sex:	UnID
Localidad:	T.12, E.6	Familia:	Felidae		
Asociacion:	N4-31	Genus:	Panthera		
Capa:	LXXXI	Specie:	onca		

Notes: Bloque de tierra 2; material muy destruido; al parecer, por la presencia de dientes desciduos se considera que sea una juvenil-temprano de felino (Felis onca). Dientes desprendidos y sin degaste. Muchos de los elementos levantados en bloque. Muy mal estado de conservacion, posiblemente fue solo craneo y mezclaron elementos de otro individuo cercano.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?:	Si	Notas	
Que tipo?	2		

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	3.9	3.8	3.1	Der.	3.8	3.7	3.1
I2/	Izq.	4.6	4.1	3.8	Der.	4.5	4.1	3.8
I3/	Izq.	8.6	5.5	5.7	Der.	8.3	5.5	5.7
Cx/	Izq.	-998	-10.3	-13.2	Der.	10.2	5.2	5.8
Pm2/	Izq.	3.2	3	4	Der.	3.1	3	3.9
Pm3/	Izq.	-10	7.1	16	Der.	9.9	7.2	16.1
Pm4/	Izq.	12.9	8.8	24	Der.	-998	-998	24.1
M1/	Izq.	0			Der.	0		

Dientes de leche?: Si

Notas:

Desgaste: Sin desgaste

Felid

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	3.3	3.5	3.3	Der.	3.3	3.5	3.2
I/2	Izq.	-998	-998	-998	Der.	3.5	3.7	3.3
I/3	Izq.	5.3	4.5	4	Der.	5.2	4.5	4.1
C/x	Izq.	-9.7	-998	-998	Der.	-998	-7.2	-10.3
Pm/3	Izq.	8.3	6.2	13.2	Der.	-998	6.3	-13
Pm/4	Izq.	10.8	7.7	16.3	Der.	10.7	7.7	16.5
M/1	Izq.	15	8.3	18.8	Der.	15.1	-998	18.8

Dientes de leche?: Si

Notas:

Desgaste: Sin desgaste

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	167.1	Class:	Mammalia	Age:	Infant
Entierro:	E.2	Orden:	Carnivora	Sex:	UnID
Localidad:	T.2, E.2	Familia:	Felidae		
Asociacion:	E.2.9, Sec.B, 75	Genus:	Felis		
Capa:	LXXI	Specie:	sp.		

Notes: Individuo muy chico con dientes casi todos deciduos, su craneo metapodiales y falanges no fusionados, se observa un corte a la altura de los huesos parietales que implica un tipo de preparacion del craneo. Hubo un fragmento de diafisis de un tibia de un sylvilagus mezclado entre estos materiales (Ele 167.2). Se ve en tamano y forma semejante a Ele 1960 de Ent.6 que fue identificado como jaguar, pero tendra que checar con un ejemplar comparativa. Frag de mamifero adulto Ele 1673.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr	7	# otras mod:	
Ubicacion de huellas:	Craneo y mandibula	Ubicacion:	

Consolidantes

Uso consolidante?: Si

Que tipo? 4

Notas: Se pego las fragmentos con Paraloid B-72. No hay indicaciones que se aplicaron otro

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.1	2.9	3.1	Der.	4	3	3.3
I2/	Izq.	4.2	3.1	3.6	Der.	-3.6	3.2	3.7
I3/	Izq.				Der.	-6.7	5.8	5.1
Cx/	Izq.	0			Der.	0		
Pm2/	Izq.	2.4	3.7	4	Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?: Si

Notas: Dientes eruptando I3,

Felid

Desgaste: No

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	3.7	3.1	3.2	Der.	3.9	3.2	3.3
I/3	Izq.	4.9	4	4	Der.	4.5	4	4.1
C/x	Izq.				Der.	0		
Pm/3	Izq.	0			Der.	0		
Pm/4	Izq.	0			Der.	0		
M/1	Izq.	0			Der.	0		

Dientes de leche? Si

Notas: Dientes eruptando C, M1

Desgaste: No

Medidas Craneo:

Long maxima craneal:	-998	Ancho del craneo:	-998	Ancho biorbital:	-998
Longitud basal:	-998	Ancho arcos zig:	93.5	Ancho min frontal:	45.3
Largo del paladar:	55.1	Ancho auricular:	-998	Longitud facial:	55
Ancho max. paladar:	60	Ancho frontal:	49.5	Fusion craneal:	Unfused
Long nasion-basion:	-998	Anch min interorb:	26.4	Nivel de fusion:	Unfused

Medidas Mandibula:

	Izq.	Der.
Long de la mand:	85	85
Long. maxima:	86	87
Altura rama mand:	37.6	37
Ancho rama mand:	26	26.8
Altura rama mand (Pm4):	17.2	17.2

Fusion de sinfisis: Unfused

Nivel de fusion: Unfused

Felid

No de Elemento:	571	Class:	Mammalia	Age:	Senior
Entierro:	E.3	Orden:	Carnivora	Sex:	Male
Localidad:	T.2, E.3	Familia:	Felidae		
Asociacion:	Esquina NW	Genus:	Puma		
Capa:	CCLXIII	Specie:	concolor		

Notes: Craneo, mandibula y garras de puma. Varias fragmentos tiene huellas de corte. Esta mezclado denticion de craneo joven (Ele 571.2) Desgaste en los dientes sugiere que es un adulto. Macho por fosa pronunciado, tamano, maduro por desgaste extensivo hasta incesivos no se ve los crestas bien y todo el craneo bien fusionado, incluso sinfisis de la mandibula.

Modificaciones del superficie

		No de patologias:	1
Mod Presente?	True	Ubicacion pat:	sinfisis de la mandibula
No de huellas de corte pr	20	# otras mod:	
Ubicacion de huellas:	Craneo sobre huesos frontal	Ubicacion:	

Consolidantes

Uso consolidante?:	Si	Notas	Se ve que aplicaron consolidante en campo y por eso la tierra esta muy pegado a la
Que tipo?	5		

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.2	2.9	3.8	Der.	0		
I2/	Izq.	4.6	3.1	4.3	Der.	0		
I3/	Izq.	7.9	5.6	5.5	Der.	0		
Cx/	Izq.	27.4	11.9	15.2	Der.	28.1	12.4	15.5
Pm2/	Izq.	2.7	3.5	4.4	Der.	3.7	3.4	5
Pm3/	Izq.	8.7	7.7	15.8	Der.	8.2	7.3	16.2
Pm4/	Izq.	11.4	8.4	23.1	Der.	10.7	8.1	23.3
M1/	Izq.	2.9	5.8	3.5	Der.	2.9	6.6	3.8

Dientes de leche?: No

Notas:

Desgaste: Desgastado

Felid

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	-998	-2.3	3	Der.	0		
I/2	Izq.	3.1	2.1	3.6	Der.	0		
I/3	Izq.	4.5	4.2	4.1	Der.	0		
C/x	Izq.	24.4	10.5	14.6	Der.	23.6	11.2	14.1
Pm/3	Izq.	7.9	6.7	13.3	Der.	7.7	6.5	13.1
Pm/4	Izq.	10.1	7.3	16	Der.	9.9	7.8	15.7
M/1	Izq.	-998	8.4	-17.9	Der.	12.2	8.4	17.5

Dientes de leche? No

Notas:

Desgaste: Desgastado

Medidas Craneo:

Long maxima craneal:	-998	Ancho del craneo:	-998	Ancho biorbital:	0
Longitud basal:	-998	Ancho arcos zig:	151.1	Ancho min frontal:	-998
Largo del paladar:	84.6	Ancho auricular:	-101.6	Longitud facial:	-68.7
Ancho max. paladar:	90	Ancho frontal:	-998	Fusion craneal:	Fused
Long nasion-basion:	-998	Anch min interorb:	-36.4	Nivel de fusion:	Mostly Fu

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:	149.7	150.2	Fusion de sinfisis:	Fused
Long. maxima:	140.2	140.1	Nivel de fusion:	Mostly Fused
Altura rama mand:	76.8	-998		
Ancho rama mand:	50.8	-998		
Altura rama mand (Pm4):	23.8	25.2		

Felid

No de Elemento:	620.1	Class:	Mammalia	Age:	Adult
Entierro:	E.3	Orden:	Carnivora	Sex:	UnID
Localidad:	T.2, E.3	Familia:	Felidae		
Asociacion:	Esquina NW, A	Genus:	Puma		
Capa:	CCLXIII	Specie:	concolor		

Notes: Todos dientes permanentes, craneo muy destruido. Hay un diente extra de M1 derecha que puede ser de otro individuo (620.2) que no se pudo medir. Mandibula casi completo. Hay 3 huellas de corte en la mandibula derecha. El superficie de los huesos son muy dificil de ver.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr	4	# otras mod:	
Ubicacion de huellas:	Mandibula derecha	Ubicacion:	

Consolidantes

Uso consolidante?:	Si	Notas	Se ve que se aplico consolidantes antes, quizas resistol deluido. Se pego fragmentos
Que tipo?	5		

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.1	2.8	4.1	Der.	0		
I2/	Izq.	5	3.9	4.2	Der.	4.4	3	4
I3/	Izq.	7.6	5.7	5.5	Der.	8.1	5.8	5.5
Cx/	Izq.	24.9	9.7	12.3	Der.	25.3	9.2	12.1
Pm2/	Izq.	0			Der.	2.7	3.7	5.1
Pm3/	Izq.	9.6	7.4	14.2	Der.	10.2	7.4	14.3
Pm4/	Izq.	11	7.2	21.5	Der.	16.3	-998	-998
M1/	Izq.	3.6	4	6.6	Der.	0		

Dientes de leche?: No

Notas:

Desgaste: Poquito

Felid

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	3.5	2.3	3.1	Der.	3.4	1.8	2.7
I/2	Izq.	2.8	2.9	3.4	Der.	3	2.5	3.1
I/3	Izq.	0			Der.	4.7	4.2	4.5
C/x	Izq.	22.6	9.1	11	Der.	24.1	8.8	11.3
Pm/3	Izq.	6.2	5.9	11.6	Der.	7.6	6.1	11.3
Pm/4	Izq.	8.9	6.7	14.2	Der.	10.3	6.8	14.1
M/1	Izq.	11.7	7.7	16.4	Der.	12.2	7.8	16.4

Dientes de leche? No

Notas:

Desgaste: poquito

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:	-998	0	Fusion de sinfisis:	Unfused
Long. maxima:	-998	-113.1	Nivel de fusion:	Unfused
Altura rama mand:	-998	-52		
Ancho rama mand:	-998	-38.1		
Altura rama mand (Pm4):	21	19.6		

Felid

No de Elemento:	192, 189	Class:	Mammalia	Age:	Infant
Entierro:	E.2	Orden:	Carnivora	Sex:	UnID
Localidad:	T.2, E.2	Familia:	Felidae		
Asociacion:	Sec.B, Parte W,	Genus:	Felis		
Capa:	LXXI	Specie:	sp.		

Notes: Sus dientes parecen a Ele 1960 pero un poco mas joven que Ele 1960. todos dientes de leche.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr	30	# otras mod:	
Ubicacion de huellas:	Craneo y mandibula	Ubicacion:	

Consolidantes

Uso consolidante?:	Si	Notas	Sin consolidantes pero se pego con B-72.
Que tipo?	4		

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	0			Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?:

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	**Izq.**	0			**Der.**	0		
I/2	**Izq.**	0			**Der.**	0		
I/3	**Izq.**	0			**Der.**	0		
C/x	**Izq.**				**Der.**	0		
Pm/3	**Izq.**	0			**Der.**	0		
Pm/4	**Izq.**	0			**Der.**	0		
M/1	**Izq.**	0			**Der.**	0		

Dientes de leche?

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	-998	Ancho del craneo:	-998	Ancho biorbital:	-998
Longitud basal:	-998	Ancho arcos zig:	-998	Ancho min frontal:	-998
Largo del paladar:	-998	Ancho auricular:	-998	Longitud facial:	-998
Ancho max. paladar:	-998	Ancho frontal:	45.5	Fusion craneal:	Unfused
Long nasion-basion:	-998	Anch min interorb:	23	Nivel de fusion:	Barely Fu

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:	83.3	93.7	Fusion de sinfisis:	Fused
Long. maxima:	97	86.2	Nivel de fusion:	Fully Fused
Altura rama mand:	34.8	35		
Ancho rama mand:	25.4	25.9		
Altura rama mand (Pm4):	17.3	18		

Felid

No de Elemento:	1380	Class:	Mammalia	Age:	Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W	Genus:	Felis		
Capa:	CXV	Specie:	sp.		

Notes: Ejemplar muy fragmentado, por lo tanto solo se pudo reconstruir los dientes y unos fragmentos de craneo y mandibula. Hay un fragmento de mandibula con pigmento y canino para analisis quimico.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: No

Notas: Solo se pego con Paraloid B-72.

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	3.2	3.9	3.2	Der.	4.7	3.9	3.6
I3/	Izq.	-998	-998	-998	Der.	8.8	5.6	4.9
Cx/	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm2/	Izq.	2.8	4.5	3.4	Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Medidas dentales (mandibulas):

Felid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	3.3	3.3	3.2	Der.	2.8	3.3	3.1
I/3	Izq.	4	4.7	4.6	Der.	4	5	4.3
C/x	Izq.	-998	-998	-998	Der.	0		
Pm/3	Izq.	0			Der.	8.2	6.9	12.2
Pm/4	Izq.	0			Der.	-998	-998	-998
M/1	Izq.	0			Der.	0		

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1381.1	Class:	Mammalia	Age:	Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W1	Genus:	Panthera		
Capa:	CXV	Specie:	onca		

Notes: Este elemento consitio de dos individuos, uno que es de jaguar y otro ejemplar mas joven y chico de puma. Guardo un fragmento craneal y un canino mandibular probablemente de individuo 2 para analisis quimico. Muy mal estado de conservacion pero no se nota suficiente fragmentos de craneo y mandibula para dos craneos completos.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: No

Notas: Solo se pego con Paraloid B-72.

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	-998	-998	-998	Der.	4.2	3.3	3
I2/	Izq.	3.9	4.2	3.5	Der.	3.5	4.1	3.4
I3/	Izq.	7.8	6	5.2	Der.	7.7	5.6	4.8
Cx/	Izq.	20.6	11.9	9.2	Der.	22.1	11.3	9.2
Pm2/	Izq.	3.2	3.8	4.9	Der.	3.1	3.9	5.1
Pm3/	Izq.	11	8.4	14.9	Der.	10.2	8	15.3
Pm4/	Izq.	-998	-998	-998	Der.	-11.1	7.6	-998
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Felid

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	-998	-998	-998	Der.	22.6	-12.3	-998
Pm/3	Izq.	8.3	6.7	12.9	Der.	8.2	6.9	12.3
Pm/4	Izq.	0			Der.	10	7.7	14.8
M/1	Izq.	0			Der.	10.4	8.5	16.9

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1381.2	Class:	Mammalia	Age:	UnID
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W1	Genus:	Puma		
Capa:	CXV	Specie:	concolor		

Notes: Segundo individuo consiste solamente por dientes permanentes pero son un poco mas chico y algunos piezas se ve que falta formar la dentina completamente.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: No

Notas: Solo se pego con Paraloid B-72.

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.5	3.2	4	Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	7.8	5.6	5.9	Der.	0		
Cx/	Izq.	-24.2	12.6	9.1	Der.	-998	10.6	8.1
Pm2/	Izq.	3	4.2	5.1	Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	11.6	8.3	-998
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	-998	9.5	7.7	Der.	-998	-998	-998
Pm/3	Izq.	7.6	5.6	11.3	Der.	7.1	5.6	11.3
Pm/4	Izq.	9.8	6.6	13.8	Der.	0		
M/1	Izq.	0			Der.	0		

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1382.1	Class:	Mammalia	Age:	Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W1	Genus:	Felis		
Capa:	CXV	Specie:	sp.		

Notes: Este elemento consiste de 5 individuos por la presencia de 5 caninos maxilares iquierdas. Hay variedad en el grado de formacion del diente aunque todos son dientes permanentes. Individuo 1 es lo mas grande y completo de los 5 posbilemente de un jaguar. Hay un fragmento de mandibula que tiene un poco de pigmento rojo adherido. Se encontro otra bolsa de material associado a este elemento donde se entrego otros fragmentos de dientes y 4 garras con un falange al ejemplar.

Modificaciones del superficie

No de patologias:

Mod Presente? False

Ubicacion pat:

No de huellas de corte pr

otras mod:

Ubicacion de huellas:

Ubicacion:

Consolidantes

Uso consolidante?: No

Notas: Solo se pego con Paraloid B-72.

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	5.9	4.1	2.9	Der.	6.2	3.9	3.1
I2/	Izq.	5.7	4.3	3.5	Der.	5.7	4.3	3.1
I3/	Izq.	9.5	4.9	5.7	Der.	9.1	5.3	4.9
Cx/	Izq.	25.2	9.6	11.8	Der.	-25.3	-9.1	-11.7
Pm2/	Izq.	3.7	3.7	4.6	Der.	0		
Pm3/	Izq.	9.8	8.6	-998	Der.	10.9	8.4	15.7
Pm4/	Izq.	0			Der.	-998	-998	-998
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Felid

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	2.6	2.9	2.2	Der.	0		
I/2	Izq.	3.3	3.4	2.9	Der.	3.8	3.5	3
I/3	Izq.	4.6	4	4	Der.	0		
C/x	Izq.	21.6	10.4	-998	Der.	22.4	10.2	7.9
Pm/3	Izq.	9	7	12.8	Der.	7.7	6.9	12.5
Pm/4	Izq.	10.8	8	14.9	Der.	11.5	7.7	15.4
M/1	Izq.	-998	-998	-998	Der.	-998	-998	-998

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.
Long de la mand:		0
Long. maxima:	0	0
Altura rama mand:	0	0
Ancho rama mand:	0	0
Altura rama mand (Pm4):	0	0

Fusion de sinfisis:

Nivel de fusion:

Felid

No de Elemento:	1382.2	Class:	Mammalia	Age:	Young Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W1	Genus:	Puma		
Capa:	CXV	Specie:	concolor		

Notes: El segundo individuo tiene todos los dientes permanentes aunque se ve que no esta completamente formado y todavia creciendo.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: No

Notas: Solo se pego con Paraloid B-72.

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	7.7	6	4.6	Der.	0		
Cx/	Izq.	-25	-998	-998	Der.	-23.2	-7.5	-10.4
Pm2/	Izq.	3.1	3.8	4.8	Der.	0		
Pm3/	Izq.	9.5	8.4	15.4	Der.	-998	-998	-998
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	5.1	4.4	3.7	Der.	0		
C/x	Izq.				Der.	0		
Pm/3	Izq.	7.8	6.2	12.3	Der.	7.7	7	12.6
Pm/4	Izq.	10.2	7.7	15.4	Der.	10.6	7.7	15.4
M/1	Izq.	0			Der.	0		

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1382.3	Class:	Mammalia	Age:	Young Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W1	Genus:	Felis		
Capa:	CXV	Specie:	sp.		

Notes: El tercer individuo esta representado igual que el individuo dos con dientes permanentes aunque todavia falta formarse. Por la caracteristicas de premolar 4 superior puede ser que es un jaguar.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: No

Notas: Solo se pego con Paraloid B-72.

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	-998	-998	4.4	Der.	0		
Cx/	Izq.	23	11.4	-9.4	Der.	-998	-998	-998
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	10.7	8.2	21.9	Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Medidas dentales (mandibulas):

Felid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.				Der.	0		
Pm/3	Izq.	0			Der.	0		
Pm/4	Izq.	0			Der.	0		
M/1	Izq.	0			Der.	12.2	8.4	17

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1382.4	Class:	Mammalia	Age:	Juvenile
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W1	Genus:	Felis		
Capa:	CXV	Specie:	sp.		

Notes: El cuarto individuo esta representado por un canino superior izquierda, molar 1 mandibular izquierda y un fragmento de mandibula. Estos dientes son permanetes aunque probablemente no fueron totalmente eruptado. Este individuo es lo mas joven de los 5 individuos presente en Ele 1382.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?:	No	Notas	Solo se pego con Paraloid B-72.
Que tipo?			

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	-998	-998	-998	Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Felid

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.				Der.	0		
Pm/3	Izq.	0			Der.	0		
Pm/4	Izq.	0			Der.	0		
M/1	Izq.	10.7	-998	17.9	Der.	0		

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1382.5	Class:	Mammalia	Age:	Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W1	Genus:	Felis		
Capa:	CXV	Specie:	sp.		

Notes: El ultimo individuo esta representado por solo el canino maxilar izquierda, por lo tanto consiste el quinto individuo. Es permanente y bien formado.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: No

Que tipo?

Notas: Solo se pego con Paraloid B-72.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	-998	-10.9	-998	Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?:

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.				Der.	0		
Pm/3	Izq.	0			Der.	0		
Pm/4	Izq.	0			Der.	0		
M/1	Izq.	0			Der.	0		

Dientes de leche?

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1500	Class:	Mammalia	Age:	Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	5-B	Genus:	Puma		
Capa:	CXV	Specie:	concolor		

Notes: En muy mal estado de conservacion. Hay fragmentos con pigmento rojo y material blanco que no se pudo reconstruir, pero son fragmentos maxilares alreadedor de los dientes y paladales. Solo eta representado por el craneo y mandibula.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: No — Notas: Solo se pego con Paraloid B-72.

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	2.9	2.7	2.9	Der.	2.8	2.9	2.9
I2/	Izq.	0			Der.	0		
I3/	Izq.	6.2	4.9	-998	Der.	6.4	4.7	6.7
Cx/	Izq.	-998	-998	-998	Der.	27.1	11.1	12.9
Pm2/	Izq.	0			Der.	2.7	3.8	4.8
Pm3/	Izq.	8.5	7.5	15.5	Der.	10.3	7.7	15.6
Pm4/	Izq.	10.9	8.3	21.3	Der.	0	0	
M1/	Izq.	1.5	1.8	4.1	Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Medidas dentales (mandibulas):

Felid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	3.9	3.6	3.9	Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm/3	Izq.	7.6	6.2	11	Der.	8	6.3	12.7
Pm/4	Izq.	9.8	-998	-14.4	Der.	-998	-998	-998
M/1	Izq.	11	8.2	17.4	Der.	9.5	8	16.8

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	-998	Ancho del craneo:	-998	Ancho biorbital:	-998
Longitud basal:	-998	Ancho arcos zig:	-998	Ancho min frontal:	-998
Largo del paladar:	-998	Ancho auricular:	-998	Longitud facial:	-998
Ancho max. paladar:	-998	Ancho frontal:	-998	Fusion craneal:	UnID
Long nasion-basion:	-998	Anch min interorb:	-998	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.
Long de la mand:	-998	-998
Long. maxima:	-998	-998
Altura rama mand:	-998	-998
Ancho rama mand:	-998	-998
Altura rama mand (Pm4):	28.7	-998

Fusion de sinfisis: UnID

Nivel de fusion:

Felid

No de Elemento:	1505	Class:	Mammalia	Age:	Young Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:		Genus:	Panthera		
Capa:	CXV	Specie:	onca		

Notes: Posible Panthera onca. Los dientes no son totalmente formado aunque son permanentes. Hay fragmentos de la mandibula izquierda que tiene pigmento rojo adherido al hueso.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: No

Notas: Solo se pego con Paraloid B-72.

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	-998	-998	-998	Der.	26.9	-998	-998
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	-7.5	-6.9	13.4	Der.	9	7.2	15.4
Pm4/	Izq.	10.9	8	-998	Der.	11.3	8.6	22.1
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Medidas dentales (mandibulas):

Felid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	20.6	11.1	-8.5	Der.	-19.5	-998	-998
Pm/3	Izq.	7.7	6.5	12.2	Der.	7.6	6.6	12.4
Pm/4	Izq.	9.6	8	14.6	Der.	9.9	7.5	14.9
M/1	Izq.	10	9.1	17	Der.	9.8	8.5	16.9

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1517	Class:	Mammalia	Age:	Young Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W2	Genus:	Puma		
Capa:	CXV	Specie:	concolor		

Notes: Todos dientes son permanentes aunque se nota que unos fragmentos de craneo no esta fusionado. Ejemplar muy fragmentado. Incluye unas garras y falanges del mismo felino. Esta mezclado unos fragmentos de garras de canido.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: No

Notas: No se aplico consolidante menos los garras de canido mezclado que aplique Reconos

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.3	2.9	3.7	Der.	4.2	3	3.8
I2/	Izq.	4.6	3.3	3.9	Der.	4	3.3	4
I3/	Izq.	8	5.6	6	Der.	8.8	5.9	6
Cx/	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm2/	Izq.	2.2	4	5.5	Der.	0		
Pm3/	Izq.	-998	-998	-998	Der.	9.2	-998	-998
Pm4/	Izq.	-998	8.9	-20.6	Der.	11.1	7.5	-998
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Medidas dentales (mandibulas):

Felid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	-998	6.8	6
C/x	Izq.				Der.	0		
Pm/3	Izq.	-998	-998	13.7	Der.	-998	6.4	-998
Pm/4	Izq.	-998	-998	-998	Der.	0		
M/1	Izq.	10	8.6	16.5	Der.	10.1	-998	14.9

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:	-998	-998	Fusion de sinfisis:	UnID
Long. maxima:	-998	-998	Nivel de fusion:	
Altura rama mand:	-998	-998		
Ancho rama mand:	-998	-998		
Altura rama mand (Pm4):	16.3	-998		

Felid

No de Elemento:	1584	Class:	Mammalia	Age:	Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W1, S5E2	Genus:	Felis		
Capa:	CXV	Specie:	sp.		

Notes: Muy fragmentado y craneo no se ve completo. Solo se pudo reconstruir unos fragmentos dentales.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: No

Notas: Solo se pego con Paraloid B-72.

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	5.3	4.2	4.3	Der.	0		
Cx/	Izq.	-998	-998	-998	Der.	-23	-9.7	-11.9
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	3.5	2.4	2.5
I/3	Izq.	0			Der.	0		
C/x	Izq.				Der.	0		
Pm/3	Izq.	0			Der.	0		
Pm/4	Izq.	0			Der.	0		
M/1	Izq.	0			Der.	0		

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1587.1	Class:	Mammalia	Age:	Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W1	Genus:	Felis		
Capa:	CXV	Specie:	sp.		

Notes: El MNI son tres, se reconstruyo varios fragmentos de la parte frontal del individuo 1 (mas grande), pero solo se pudo reconstruir dientes de individuo 2 y 3. Hay material blanca (cal o ceniza) adherido al interior del cerebro. Se aplico Reconos 110 y 220 pero se tomo un fragmento de canino inferior (possible de individuo 2) y fragmento de craneo para analisis quimico. Todos los dientes permanentes y desgastado. Incluye tres falanges y una garra.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: Si

Que tipo? 3

Notas: Se aplico reconos 110 y 220 pero se tomo un fragmento de canino inferior (posible de

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	3.9	3.5	4.4
I2/	Izq.	0			Der.	4.5	4.1	4.3
I3/	Izq.	7.3	4.2	5.1	Der.	7.1	5.3	5.6
Cx/	Izq.	23.1	-998	12.1	Der.	25	10.4	13.5
Pm2/	Izq.	0			Der.	1.9	3.5	4.1
Pm3/	Izq.	8.3	8.5	16.1	Der.	8.9	9.1	16.4
Pm4/	Izq.	11	8.7	23	Der.	10.5	9	22.9
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Felid

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	7.4	-998	-998
C/x	Izq.	-22.9	12.8	-998	Der.	22.4	-998	11.1
Pm/3	Izq.	7.3	6.5	13.1	Der.	7.8	6	12.7
Pm/4	Izq.	9.3	-998	14.3	Der.	9.3	7.2	15.6
M/1	Izq.	11.2	8.4	17.1	Der.	10.1	8.4	17.2

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.
Long de la mand:		0
Long. maxima:	0	0
Altura rama mand:	0	0
Ancho rama mand:	0	0
Altura rama mand (Pm4):	0	0

Fusion de sinfisis:

Nivel de fusion:

Felid

No de Elemento:	1587.2	Class:	Mammalia	Age:	Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W1	Genus:	Puma		
Capa:	CXV	Specie:	concolor		

Notes: El segundo individuo es mas chica que el primero y es de puma.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: Si

Que tipo? 3

Notas: Se aplico reconos 110 y 220 pero se tomo un fragmento de canino inferior (posible de

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	10.4	8.3	15.4	Der.	9.5	8.3	15.2
Pm4/	Izq.	11.5	7.8	22.9	Der.	11.7	8.4	23.5
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	-998	-998	11.8	Der.	0		
Pm/3	Izq.	0			Der.	7.6	6.3	12.8
Pm/4	Izq.	10.1	7.3	15.2	Der.	10.2	6.9	-998
M/1	Izq.	9.6	8.1	16.9	Der.	0		

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1587.3	Class:	Mammalia	Age:	Young Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W1	Genus:	Puma		
Capa:	CXV	Specie:	concolor		

Notes: Ejemplar mas chica sin mucho desgaste auqnue todos los dientes son permanentes.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: Si

Que tipo? 3

Notas: Se aplico reconos 110 y 220 pero se tomo un fragmento de canino inferior (posible de

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.				Der.	0		
Pm/3	Izq.	-998	-998	-998	Der.	7	5.5	11.9
Pm/4	Izq.	8.9	-7.5	15.8	Der.	0		
M/1	Izq.	0			Der.	0		

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1587.4	Class:	Mammalia	Age:	Young Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W1	Genus:	Puma		
Capa:	CXV	Specie:	concolor		

Notes: Individuo 4 representado solamente por la presencia de premolar tres inferior derecha.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: Si

Que tipo? 3

Notas: Se aplico reconos 110 y 220 pero se tomo un fragmento de canino inferior (posible de

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	0			Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?:

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.				Der.	0		
Pm/3	Izq.	9.4	-998	13.5	Der.	0		
Pm/4	Izq.	0			Der.	0		
M/1	Izq.	0			Der.	0		

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1593	Class:	Mammalia	Age:	Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W1	Genus:	Puma		
Capa:	CXV	Specie:	concolor		

Notes: Material muy fragmentado, solo se pudo reconstruir unos dientes para identificar que todos son permanentes y por el nivel alto de desgaste lo asigne como adulto.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: No

Notas: Solo se pego con Paraloid B-72.

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm4/	Izq.	-998	8.2	22.4	Der.	-998	-998	-998
M1/	Izq.	0			Der.	1.8	3.3	7

Dientes de leche?: No

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.				Der.	0		
Pm/3	Izq.	0			Der.	-998	-998	-998
Pm/4	Izq.	-8.6	-998	-13.4	Der.	-998	-998	-998
M/1	Izq.	10.1	7.6	17.3	Der.	10.4	-998	18.1

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1636.1	Class:	Mammalia	Age:	Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:		Genus:	Puma		
Capa:	CXV	Specie:	concolor		

Notes: Fragmentos de craneo de felino recolectado como parte de Ele 1636 de canido completo. Muy fragmentado, por lo tanto solo se pudo reconstuir unos fragmentos dentales.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: No

Notas: Solo se pego con Paraloid B-72.

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	0			Der.	25.9	-998	13.3
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	11.4	8.5	22.1
M1/	Izq.	1.4	6.8	4.4	Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Medidas dentales (mandibulas):

Felid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.				Der.	-998	-998	-998
Pm/3	Izq.	0			Der.	8	-998	12.6
Pm/4	Izq.	9.5	-6.9	-15.1	Der.	-998	-998	-998
M/1	Izq.	-998	-998	-998	Der.	10.4	-998	17.5

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1639	Class:	Mammalia	Age:	Juvenile
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:		Genus:	Puma		
Capa:	CXV	Specie:	concolor		

Notes: Dientes permanentes pero individuo muy joven porque no esta fusionado su craneo, ni huesos largos, ni vertebras. Se aplico Reconos 110 y 220 y pego con B-72. Esta mezclado fragmentos de canido en estas bolsas aunque son muy fragmentados probablemente de Ele 1636.2. Huesos tiene aparencia de entenperizacion pero pensamos que es en general el proceso tafonomico del entierro que causa esta aparencia a los huesos. Hay un fragmento de molar 1 inferior permanente de otro felino, possible de Ele 1636.1. Many elements badly preserved but probably was complete indivdiual.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: Si

Que tipo? 3

Notas

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.2	2.8	3.5	Der.	0		
I2/	Izq.	4.5	3	3.9	Der.	4.2	3.6	3.5
I3/	Izq.	7.3	5.5	5.9	Der.	7.4	-998	5.7
Cx/	Izq.	20.7	9.8	11.8	Der.	23.9	10	13
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	8.6	7.7	15.3	Der.	8.6	6.9	-998
Pm4/	Izq.	10.8	7.4	20.9	Der.	-998	6.9	-21.3
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Felid

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	3.4	3.3	3.3	Der.	4.2	3.3	3.3
I/2	Izq.	4.8	4.3	4.2	Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	-998	-998	-998	Der.	-998	-998	-12.3
Pm/3	Izq.	7.1	-6.3	12.3	Der.	7	5.6	12.5
Pm/4	Izq.	8.9	7.2	14.9	Der.	8.9	6.6	15.1
M/1	Izq.	8.6	8.2	16.5	Der.	9.5	8.2	16.4

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	-998	Ancho del craneo:	62	Ancho biorbital:	0
Longitud basal:	-998	Ancho arcos zig:	-998	Ancho min frontal:	41
Largo del paladar:	-998	Ancho auricular:	-998	Longitud facial:	-998
Ancho max. paladar:	-998	Ancho frontal:	50	Fusion craneal:	Unfused
Long nasion-basion:	103	Anch min interorb:	30	Nivel de fusion:	Less than

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:	-998	-998	Fusion de sinfisis:	Not Relevant
Long. maxima:	-998	-998	Nivel de fusion:	
Altura rama mand:	-998	-998		
Ancho rama mand:	-998	-998		
Altura rama mand (Pm4):	-998	14		

Felid

No de Elemento:	574.2	Class:	Mammalia	Age:	Juvenile/Adult
Entierro:	E.3	Orden:	Carnivora	Sex:	UnID
Localidad:	T.2, E.3	Familia:	Felidae		
Asociacion:	Animal VII, SW	Genus:	Puma		
Capa:	CCLXIII	Specie:	concolor		

Notes: Fragmentos de dientes de felino mezclado con el lobo Ele 574.1. Todos los dientes son permanentes que suguieren que se trata de un jovenil mas de un ano u adulto. Unos fragmentos tiene pigmento rojo adherido a ellos. Canino superior izquierda esta trabajado con un corte transversal donde termina la esmalde. Materiales ya estaba consolidado cuando se analizaron. Tambien incluye un falange izquierda distal.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr	1	# otras mod:	
Ubicacion de huellas:	Canino superior izquierda	Ubicacion:	

Consolidantes

Uso consolidante?: Si

Que tipo? 5

Notas: Probablemente resistol deluido, se pego posteriormente con paraloid B-72 y alugnos

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	26.5	11.2	12	Der.	0		
Pm2/	Izq.	0			Der.	3.3	5.1	5.4
Pm3/	Izq.	0			Der.	-8.4	-7	-998
Pm4/	Izq.	11.1	-8	-998	Der.	-998	-998	-998
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Felid

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	5.1	4.1	4.4
I/2	Izq.	0			Der.	-998	4.8	-998
I/3	Izq.	0			Der.	0		
C/x	Izq.	-998	-998	-998	Der.	-20.2	-998	-998
Pm/3	Izq.	0			Der.	-998	-998	-998
Pm/4	Izq.	10.3	7.4	14.1	Der.	0		
M/1	Izq.	11.6	6.7	-998	Der.	11.2	8.2	15.9

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	578.2	Class:	Mammalia	Age:	Juvenile/Adult
Entierro:	E.3	Orden:	Carnivora	Sex:	UnID
Localidad:	T.2, E.3	Familia:	Felidae		
Asociacion:	Animal XI, SE	Genus:	Puma		
Capa:	CCLXIII	Specie:	concolor		
Notes:	Dientes de felino mezclado con los materiales de canido.				

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?:	-998	Notas	Probablemente resistol deluido, se pego posteriormente con paraloid B-72 y alugnos
Que tipo?			

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	4.7	3.6	3.8
I3/	Izq.	0			Der.	7.8	6.1	5.8
Cx/	Izq.	-998	8.6	12	Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	-998	-998	-998	Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.				Der.	0		
Pm/3	Izq.	0			Der.	0		
Pm/4	Izq.	0			Der.	0		
M/1	Izq.	0			Der.	11	8.2	17.6

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	597.3	Class:	Mammalia	Age:	Adult
Entierro:	E.3	Orden:	Carnivora	Sex:	UnID
Localidad:	T.2, E.3	Familia:	Felidae		
Asociacion:	SE, W de ele 57	Genus:	Puma		
Capa:	CCLXIII	Specie:	concolor		

Notes: Mandibula, parte de maxilar y unos dientes de felino mezclado con craneos de canidos. Parte maxilar solo parte izquierda de inicisivo 2 y incisivo 3 superior y parte derecha del premolar 2 superior.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: Si

Que tipo? 5

Notas: Probablemente resistol deluido, se pego posteriormente con paraloid B-72 y alugnos

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	0			Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?:

Notas:

Desgaste:

Medidas dentales (mandibulas):

Felid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	3.4	3.1	3.7	Der.	4.1	3.4	-998
I/2	Izq.	5.2	6.7	4.2	Der.	4.4	3.4	-998
I/3	Izq.	0			Der.	0		
C/x	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm/3	Izq.	8.3	6.8	-998	Der.	8.4	6.8	-998
Pm/4	Izq.	0			Der.	0		
M/1	Izq.	0			Der.	0		

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	187	Class:	Mammalia	Age:	Infant
Entierro:	E.2	Orden:	Carnivora	Sex:	UnID
Localidad:	T.2, E.2	Familia:	Felidae		
Asociacion:	Sec.A	Genus:	Felis		
Capa:		Specie:	sp.		

Notes: Cria o juvenile. Mandibula y maxilar de animal en asociacion a 2.A. Individuo con unos dientes deciduas (Pm1 inf, Pm2 inf, C1 sup) pero muchos ya permanente. Probablemente tiene 7-8 meses de edad por la presencia de caninos inferiores permantentes y caninos superiores deciduas. Varias huesos quemados, particularmente donde hay fracturas en las regiones de la mandibula y paladar.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	2
Ubicacion de huellas:		Ubicacion:	Paladar y mandibula

Consolidantes

Uso consolidante?: Si

Que tipo? 4

Notas: Sin consolidante, se pego con B-72.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.7	2.8	3.9	Der.	4.6	2.8	3.9
I2/	Izq.	5.3	3.3	4	Der.	4.8	3.4	4.1
I3/	Izq.	8	4.5	5.8	Der.	8.9	4.9	5.7
Cx/	Izq.	-998	11.2	11.8	Der.	-25.5	11	11.2
Pm2/	Izq.	3.1	2.6	4.5	Der.	2.6	3.6	4.8
Pm3/	Izq.	9.1	7	15.3	Der.	9.3	7.2	15.6
Pm4/	Izq.	12	7.6	-998	Der.	12	7.5	-998
M1/	Izq.	-999	-999	-999	Der.	-999	-999	-999

Dientes de leche?: Si

Notas: Cx en alveolar, Pm3 en

Desgaste: No

Felid

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	3.4	2.2	3	Der.	3.9	2.2	2.9
I/2	Izq.	3.8	3.2	3.4	Der.	3.9	3.1	3.4
I/3	Izq.	5.5	4.3	4.4	Der.	5.7	4.3	4.2
C/x	Izq.				Der.	0		
Pm/3	Izq.	0			Der.	0		
Pm/4	Izq.	8.9	6.4	-14	Der.	10.4	7.4	-998
M/1	Izq.	0			Der.	0		

Dientes de leche? Si

Notas: Pm3 y Pm4 en alveolar, Cx en erupcion

Desgaste: No

Medidas Craneo:

Long maxima craneal:	-998	Ancho del craneo:	-998	Ancho biorbital:	-998
Longitud basal:	-998	Ancho arcos zig:	-998	Ancho min frontal:	-998
Largo del paladar:	-998	Ancho auricular:	-998	Longitud facial:	-998
Ancho max. paladar:	-998	Ancho frontal:	-998	Fusion craneal:	Unfused
Long nasion-basion:	-998	Anch min interorb:	-998	Nivel de fusion:	Barely Fu

Medidas Mandibula:

	Izq.	Der.
Long de la mand:	-998	-998
Long. maxima:	-998	-998
Altura rama mand:	-998	-998
Ancho rama mand:	-998	-998
Altura rama mand (Pm4):	-998	-998

Fusion de sinfisis: Unfused

Nivel de fusion: Barely Fused

Felid

No de Elemento:	632.1	Class:	Mammalia	Age:	Senior
Entierro:	E.3	Orden:	Carnivora	Sex:	Poss. M
Localidad:	T.2, E.3	Familia:	Felidae		
Asociacion:	SW	Genus:	Puma		
Capa:	CCLXIII	Specie:	concolor		

Notes: Animal III (una etiqueta dice XVIII) Un individuo grande en tamano de crraneo y dientes representado por piezas maxilares, mandibulares y piezas dentares. Mandibula y dentadura de otro felino mas chico mezclado. Los dientes como los premolares presenta mucho desgaste. El canino superior derecha se ve fragmentado como si fuera fracturado intencionalmente. Suturas fusionado del premaxilar y desgaste extenso suguiere es un individuo maduro. Se extrayo un fragmento de mandibula que se ve que parte de Ele 642 el canido. Se identifico fragmentos mezclados de falanges y garras de este individuo con material de Ele 600.

Modificaciones del superficie

Mod Presente?	False	No de patologias:	
No de huellas de corte pr		Ubicacion pat:	
Ubicacion de huellas:		# otras mod:	
		Ubicacion:	

Consolidantes

Uso consolidante?: -998

Que tipo? 5

Notas: Prob por resistol deluido si fue aplicado.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4	3.1	4	Der.	4.1	2.6	4.2
I2/	Izq.	4.4	4.1	4.3	Der.	4.5	3.2	3.9
I3/	Izq.	7.7	5	6	Der.	7.8	5.9	5.9
Cx/	Izq.	-998	9.5	11.3	Der.	-998	-998	-998
Pm2/	Izq.	4	4	5	Der.	-999	-999	-999
Pm3/	Izq.	-998	7.2	16.4	Der.	-998	7.8	16.2
Pm4/	Izq.	10.8	7.8	21.8	Der.	10.3	7.6	21.7
M1/	Izq.	-999	-999	-999	Der.	-999	-999	-999

Dientes de leche?: No

Felid

Notas:

Desgaste: Si poco

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	3.5	3.3	3.6	Der.	4	3.5	3.6
I/2	Izq.	-999	-999	-999	Der.	4.4	4.1	4.4
I/3	Izq.	5.3	4.8	4.5	Der.	4.8	4.8	4.4
C/x	Izq.	-998	10.2	13.8	Der.	-998	-998	-998
Pm/3	Izq.	8.5	6.7	14	Der.	-998	8	15
Pm/4	Izq.	10.9	8.1	14.9	Der.	-998	-998	-998
M/1	Izq.	12.5	8.4	17.4	Der.	-999	-999	-999

Dientes de leche? No

Notas:

Desgaste: Si poco

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	632.2	Class:	Mammalia	Age:	Juvenile
Entierro:	E.3	Orden:	Carnivora	Sex:	UnID
Localidad:	E.3	Familia:	Felidae		
Asociacion:	SW	Genus:	Puma		
Capa:	CCLXIII	Specie:	concolor		

Notes: Estaba mezclado con los materiales de Ele 632.1 que incluye un par de mandibulas y denticion de felino mas chico. Todos los dientes mandibulares presentes son permanentes pero no se nota desgaste en ninguno de ellos y por el tamano se asigno como juvenile. Es mas o menos del tamana del puma de Ent 6, Ele 1818.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: Si

Que tipo? 5

Notas: Posiblemente resistol deluido, pego con Paraloid B-72.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	0			Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Dientes de leche?:

Notas:

Desgaste:

Felid

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	-19.8	-998	10.3	Der.	-998	10.1	10.9
Pm/3	Izq.	6.6	6.4	12.8	Der.	-998	-998	-998
Pm/4	Izq.	-998	-998	-998	Der.	0		
M/1	Izq.	0			Der.	11	7.5	16.2

Dientes de leche? No

Notas:

Desgaste: No

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	154.1	Class:	Mammalia	Age:	Young Adult
Entierro:	E.2	Orden:	Carnivora	Sex:	Male
Localidad:	T.2, E.2	Familia:	Felidae		
Asociacion:	E.2.7	Genus:	Puma		
Capa:	LXXI	Specie:	concolor		

Notes: 1 1/2 anos, todo denticion es permanente pero ningun hueso largo ni vertebra esta fusionado, por lo tanto pensamos que es un poco mas grande que un ano de edad. Tampoco hay desgaste muy obvio en los dientes. Ejemplar completo. Se identifico un metapodial, un falange y una garra de conejo con otros materiales posiblemente de un ave chico. En la muestra de coprolitos tambien hubo huesos incluyendo un falange de un mamifero chico, quizas un conejo. Tambien hubo dos fragmento de dientes de conejo junto con otros huesos no identificados.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: Si

Que tipo? 5

Notas: Parece que ya habia aplicado consolidante a esta ejemplar (posiblemente resistol deluido

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.3	3.1	4	Der.	4.4	3.2	3.7
I2/	Izq.	4.9	3.6	4	Der.	4.9	3.7	4.1
I3/	Izq.	7.8	5.5	5.7	Der.	8.7	5.9	5.8
Cx/	Izq.	23.9	11.4	13.1	Der.	28.8	12.9	14
Pm2/	Izq.	2.9	3.4	3.5	Der.	2.1	3.2	4
Pm3/	Izq.	8.7	7.7	16.3	Der.	0		
Pm4/	Izq.	11.9	7.8	22.6	Der.	11.2	8	22.8
M1/	Izq.	0			Der.	1.6	3.6	2

Dientes de leche?: No

Felid

Notas:

Desgaste: No

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	3.5	2.3	3	Der.	3.6	2.5	3
I/2	Izq.	3.6	3.3	3.4	Der.	3.8	3.3	3.7
I/3	Izq.	4.7	4.4	4.6	Der.	4.9	4.2	4.5
C/x	Izq.	24.2	9.5	12.5	Der.	22.4	9.6	12.3
Pm/3	Izq.	8	6.7	12.7	Der.	8.1	6.6	12.6
Pm/4	Izq.	10.2	7.8	15.2	Der.	10.8	7.5	15.6
M/1	Izq.	10.8	8.1	17	Der.	9.3	7.6	16.9

Dientes de leche? No

Notas:

Desgaste: No

Medidas Craneo:

Long maxima craneal:	-998	Ancho del craneo:	-68.1	Ancho biorbital:	-998
Longitud basal:	-998	Ancho arcos zig:	-998	Ancho min frontal:	43.8
Largo del paladar:	69.9	Ancho auricular:	-998	Longitud facial:	-998
Ancho max. paladar:	-81.6	Ancho frontal:	67.6	Fusion craneal:	Unfused
Long nasion-basion:	-998	Anch min interorb:	36.2	Nivel de fusion:	Less than

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:	-998	-998	Fusion de sinfisis:	Not Relevant
Long. maxima:	-998	-998	Nivel de fusion:	
Altura rama mand:	54.4	-998		
Ancho rama mand:	35.8	-998		
Altura rama mand (Pm4):	-18.8	19.7		

Felid

No de Elemento:	143	Class:	Mammalia	Age:	Young Adult
Entierro:	E.2	Orden:	Carnivora	Sex:	Poss. F
Localidad:	T.2, E.2	Familia:	Felidae		
Asociacion:	Seccion B	Genus:	Puma		
Capa:	LXXI	Specie:	concolor		

Notes: Individuo completo, uno de dos felinos enjaulados en este entierro. Todo denticion permanente aunque todo huesos largos, vertebras y craneo no esta fusionado, por lo tanto probablemente se trata de un individuo juvenile (1 1/2~2 anos).

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: Quizas

Que tipo? 5

Notas: Parece que ya habia aplicado consolidante a esta ejemplar (posiblemente resistol deluido

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.2	2.5	3.9	Der.	0		
I2/	Izq.	4.4	3.3	4.1	Der.	0		
I3/	Izq.	7.9	4.6	5.5	Der.	8.4	4.9	6
Cx/	Izq.	27.7	10.4	13.4	Der.	27.3	9.6	13.1
Pm2/	Izq.	3.7	3.7	3.5	Der.	0		
Pm3/	Izq.	10.2	7.8	15.4	Der.	10	8	15.5
Pm4/	Izq.	11.8	7.4	22.5	Der.	12.2	7.8	22.2
M1/	Izq.	1.5	3.6	2.3	Der.	0		

Dientes de leche?: No

Notas:

Desgaste: No desgastado

Medidas dentales (mandibulas):

Felid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	3.2	2.5	3.3	Der.	3	2.4	3.1
I/2	Izq.	3.6	2.7	3.6	Der.	3.6	3.2	3.6
I/3	Izq.	4.6	3.6	4.3	Der.	4.5	4.3	4.5
C/x	Izq.	23.5	9.5	12.1	Der.	22.8	9.4	12.8
Pm/3	Izq.	8.5	6.6	12.4	Der.	8.5	7.3	12.6
Pm/4	Izq.	11.1	7.5	14.1	Der.	11.3	7.7	14.4
M/1	Izq.	12.4	7.7	17.8	Der.	12.8	7.9	17.3

Dientes de leche? No

Notas:

Desgaste: No desgastado

Medidas Craneo:

Long maxima craneal:	-998	Ancho del craneo:	-64.5	Ancho biorbital:	-998
Longitud basal:	-998	Ancho arcos zig:	-998	Ancho min frontal:	-998
Largo del paladar:	-998	Ancho auricular:	-998	Longitud facial:	-76
Ancho max. paladar:	-998	Ancho frontal:	-998	Fusion craneal:	Unfused
Long nasion-basion:	-998	Anch min interorb:	-998	Nivel de fusion:	Less than

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:	116.3	117	Fusion de sinfisis:	Unfused
Long. maxima:	117.1	-998	Nivel de fusion:	Unfused
Altura rama mand:	53.5	55		
Ancho rama mand:	35.7	-998		
Altura rama mand (Pm4):	20.8	20.9		

Felid

No de Elemento:	512	Class:	Mammalia	Age:	Adult
Entierro:	E.3	Orden:	Carnivora	Sex:	UnID
Localidad:	T.2, E.3	Familia:	Felidae		
Asociacion:	NW	Genus:	Felis		
Capa:	CCLXIII	Specie:	sp.		

Notes: Etiqueta dice orilla N de la fos (NW). Puede ser de dos individuos distinctos aunque se trata de de los caninos superiores derecha y izquierda. El canino superior derecha sin la raiz. Se ve claramente que la raiz fue cortado, posiblemente fue usado cono adorno. Es diente permantnet y por la presencia de desgaste probablemente se trata de un individuo adulto. El canino superior izquierda, aunque se puede ser del mismo individuo, por la diferencia de coloracion y el tamano es ligeramente mas chico, pensamos que se puede ser de dos individuos. Se extrayeron solamente los caninos de estos individuos y el canino izquierda tambien esta cortado. Se registro como un elemento.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: -998 Notas

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	21.8	9.5	12.8	Der.	22.9	9.7	13
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	0			Der.	0		

Felid

Dientes de leche?:

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.				Der.	0		
Pm/3	Izq.	0			Der.	0		
Pm/4	Izq.	0			Der.	0		
M/1	Izq.	0			Der.	0		

Dientes de leche?

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	PPS151.1, 315,	Class:	Mammalia	Age:	Young Adult
Entierro:	O.2	Orden:	Carnivora	Sex:	Female
Localidad:	F.C, O.2, T.3	Familia:	Felidae		
Asociacion:	P.59	Genus:	Puma		
Capa:	III y VIII	Specie:	concolor		

Notes: Craneo y garras de una puma. Tiene todo su denticion permanente pero su craneo no esta fusionado, los dientes no estan desgastados y por lo tanto pensamos que se trata de un individuo adulto joven. Las marcas musculares en su parietales nos indica se trata de un individuo hembra. Tambien se registro la presencia de falanges y garras levantada como parte de ele 315 y 309 que fue verificada como del mismo individuo por las medidas de los falanges comparando con los de Ele 151 levantado junto con el craneo. Muchas huellas presentes. Material de Ele 152 probablemente del mismo individuo.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr	30	# otras mod:	
Ubicacion de huellas:	craneo, mandibula y falanges	Ubicacion:	

Consolidantes

Uso consolidante?: No

Notas: Uso B-72 para pegar.

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.1	2.9	3.5	Der.	4.1	2.7	3.9
I2/	Izq.	4.4	3.2	4.1	Der.	4.6	3.1	4.1
I3/	Izq.	7.8	5.4	6.5	Der.	8.2	4.9	5.8
Cx/	Izq.	24	9.1	11.1	Der.	21.9	8.9	11.6
Pm2/	Izq.	3.1	3.7	4.2	Der.	3.8	3.6	4.3
Pm3/	Izq.	8.8	6.6	14.2	Der.	9	7.2	14.4
Pm4/	Izq.	11	7.4	21.3	Der.	11.6	7.1	21.1
M1/	Izq.	2.5	6.9	3.5	Der.	2.5	6.8	3.4

Dientes de leche?: No

Felid

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	2.8	2.3	2.9	Der.	2.9	1.9	3
I/2	Izq.	3.1	2.9	3.4	Der.	3.3	2.8	3.4
I/3	Izq.	4.2	3.8	4.2	Der.	4.4	4.1	4.2
C/x	Izq.	21.2	8.1	10.4	Der.	20.6	8.1	10.7
Pm/3	Izq.	7.7	6	11.4	Der.	7.6	5.2	11.4
Pm/4	Izq.	9.9	14.3	14.3	Der.	10.4	6.1	14.9
M/1	Izq.	9.9	7.4	15.4	Der.	10.2	7.4	15.3

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	-998	Ancho del craneo:	-998	Ancho biorbital:	-998
Longitud basal:	-158	Ancho arcos zig:	118	Ancho min frontal:	45
Largo del paladar:	76	Ancho auricular:	72	Longitud facial:	-72
Ancho max. paladar:	-67	Ancho frontal:	-998	Fusion craneal:	Unfused
Long nasion-basion:	-998	Anch min interorb:	-998	Nivel de fusion:	Unfused

Medidas Mandibula:

	Izq.	Der.
Long de la mand:	115	116.5
Long. maxima:	112	108
Altura rama mand:	50	51
Ancho rama mand:	34.5	-40
Altura rama mand (Pm4):	18	19

Fusion de sinfisis: Unfused

Nivel de fusion: Unfused

Felid

No de Elemento:	270	Class:	Mammalia	Age:	Juvenile
Entierro:	E.2	Orden:	Carnivora	Sex:	UnID
Localidad:	T.2, E.2	Familia:	Felidae		
Asociacion:	Sec.E, E. 2.11	Genus:	Puma		
Capa:	LXXI	Specie:	concolor		

Notes: Craneo y mandibula muy fragmentado. Solo se pudo reconstruir las piezas dentales. Incluye una que otra diente deciduo.

Modificaciones del superficie

Mod Presente?	False	No de patologias:	
No de huellas de corte pr		Ubicacion pat:	
Ubicacion de huellas:		# otras mod:	
		Ubicacion:	

Consolidantes

Uso consolidante?: No

Notas

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	4.2	2.9	4.2	Der.	4.6	2.9	4.2
I2/	Izq.	4.6	3.7	4.4	Der.	5	3.8	4.3
I3/	Izq.	8.4	5.2	6.1	Der.	8.5	5.3	6.2
Cx/	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm2/	Izq.	-998	-998	-998	Der.	2.5	2.6	3.4
Pm3/	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm4/	Izq.	11.9	8	21.5	Der.	-998	-998	-998
M1/	Izq.	2.1	3.8	6.4	Der.	1.9	3.5	6.2

Dientes de leche?: Si

Notas:

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	Izq.	3.4	2.4	3	Der.	3.7	2.3	3.1
I/2	Izq.	2.7	3	3.5	Der.	3.5	3.1	3.5
I/3	Izq.	5.3	4	4.2	Der.	4.7	4	4.4
C/x	Izq.	-998	-9.6	-11.9	Der.	-998	-998	-998
Pm/3	Izq.	-7.6	-998	11.7	Der.	7.8	6.3	11.7
Pm/4	Izq.	-10.8	-7.2	-998	Der.	11	7.4	15.2
M/1	Izq.	10.5	7.6	15.4	Der.	13.2	7.8	15.5

Dientes de leche? Si

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.
Long de la mand:		0
Long. maxima:	0	0
Altura rama mand:	0	0
Ancho rama mand:	0	0
Altura rama mand (Pm4):	0	0

Fusion de sinfisis:

Nivel de fusion:

Felid

No de Elemento:	1054	Class:	Mammalia	Age:	Adult
Entierro:	E.5	Orden:	Carnivora	Sex:	UnID
Localidad:	T.8, E.5	Familia:	Felidae		
Asociacion:	W3, S2E2	Genus:	Puma		
Capa:	CXV	Specie:	concolor		

Notes: Ejemplar muy fragmentado, solo se reconstuyo la denticion. La mayoria de los fragmentos del craneo de la region maxilar y premaxilar que se pudo identificar, no se nota fragmentos de neurocraneo. Fragmentos de mandibula presentes. Pm3 con una caracteristica de cuspide extra.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: No

Notas

Que tipo?

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	-998	-998	-998	Der.	-998	-998	-998
I2/	Izq.	-5.5	-998	-998	Der.	5.5	3	-998
I3/	Izq.	-10.2	-998	-998	Der.	10.7	-998	-998
Cx/	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm2/	Izq.	-998	-3.9	-5.2	Der.	0		
Pm3/	Izq.	10.3	8.3	15.5	Der.	-11.5	-9	15.4
Pm4/	Izq.	10.8	10.7	21.1	Der.	-998	-998	-998
M1/	Izq.	0			Der.	0		

Dientes de leche?:

Notas:

Desgaste:

Felid

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	4.3	2.7	3.7	Der.	4.1	2.6	3
I/2	Izq.	-998	3.7	-998	Der.	-998	-998	-998
I/3	Izq.	6.5	4.7	5.4	Der.	0		
C/x	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm/3	Izq.	8.1	7.3	13.6	Der.	-998	7.4	-13.4
Pm/4	Izq.	11.7	9	18.1	Der.	-998	-998	-998
M/1	Izq.	-998	-998	-20	Der.	-998	-998	-998

Dientes de leche?

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:		0	Fusion de sinfisis:	
Long. maxima:	0	0	Nivel de fusion:	
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	0	0		

Felid

No de Elemento:	1887	Class:	Mammalia	Age:	Young Adult
Entierro:	E.6	Orden:	Carnivora	Sex:	UnID
Localidad:	T.12, E.6	Familia:	Felidae		
Asociacion:	N4-31	Genus:	Panthera		
Capa:	LXXXI	Specie:	onca		

Notes: Craneo fragmentado. Se encontro una falange para analisis quimico. Muy mal esatdo de preservacion, probablemente fue individuo completo pero muy fragmentado para reconstruir. Huesos largos no fusionados.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	False	Ubicacion pat:	
No de huellas de corte pr		# otras mod:	
Ubicacion de huellas:		Ubicacion:	

Consolidantes

Uso consolidante?: Si

Notas

Que tipo? 2

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	4.7	-998	2.5	Der.	0		
I3/	Izq.	8.3	5.4	5.5	Der.	0		
Cx/	Izq.	25.7	13.5	12.3	Der.	0		
Pm2/	Izq.	2	3.6	5.6	Der.	10.1	-998	15.7
Pm3/	Izq.	9.6	6.8	15.9	Der.	9.8	7.7	15.8
Pm4/	Izq.	11.7	9.7	21.2	Der.	11.9	10.2	22.2
M1/	Izq.	0			Der.	2.6	2.2	2.7

Dientes de leche?:

Notas:

Desgaste:

Medidas dentales (mandibulas):

Felid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	3.5	3.5	2.8	Der.	0		
I/3	Izq.	4.8	4.2	4.1	Der.	0		
C/x	Izq.	22.8	11.2	12	Der.	0		
Pm/3	Izq.	7.6	-8.3	13.6	Der.	7		12
Pm/4	Izq.	9.9		15.7	Der.	0		
M/1	Izq.	13.2		16.2	Der.	10.8	8.1	16.7

Dientes de leche?

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho arcos zig:	0	Ancho min frontal:	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	-52.3
Ancho max. paladar:	0	Ancho frontal:	0	Fusion craneal:	
Long nasion-basion:	0	Anch min interorb:	0	Nivel de fusion:	

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:	134	0	Fusion de sinfisis:	Unfused
Long. maxima:	0	0	Nivel de fusion:	Unfused
Altura rama mand:	0	0		
Ancho rama mand:	0	0		
Altura rama mand (Pm4):	22.5	0		

Felid

No de Elemento:	1960	Class:	Mammalia	Age:	Infant
Entierro:	E.6	Orden:	Carnivora	Sex:	UnID
Localidad:	T.12, E.6	Familia:	Felidae		
Asociacion:		Genus:	Panthera		
Capa:	LXXXI	Specie:	onca		

Notes: Craneo incompleto sin occipital y con huellas de corte en arcos cigomaticos, bulla auricular derecha y mandibulas. Dientes permanentes en erupción. Cría avanzada.

Modificaciones del superficie

		No de patologias:	
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr	22	# otras mod:	
Ubicacion de huellas:	Craneo y mandibula	Ubicacion:	

Consolidantes

Uso consolidante?:	Si	Notas	
Que tipo?	2		

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	-998	3.2	2.4	Der.	0	3.1	3
I3/	Izq.	0			Der.	0		
Cx/	Izq.	0			Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0	0	
M1/	Izq.	-998	3.2	6.2	Der.	-998	3.9	6.7

Dientes de leche?: Si

Notas: I2, I3, Pm4 y M1 en eru

Desgaste:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Felid

I/1	Izq.	0			Der.	0	
I/2	Izq.	0			Der.	0	
I/3	Izq.	0			Der.	0	
C/x	Izq.				Der.	0	
Pm/3	Izq.	0			Der.	0	
Pm/4	Izq.	0			Der.	0	
M/1	Izq.	0			Der.	0	

Dientes de leche? Si

Notas: C, M1 en erupcion.

Desgaste:

Medidas Craneo:

Long maxima craneal:	0	Ancho del craneo:	-66.7	Ancho biorbital:	-70.4
Longitud basal:	-123.2	Ancho arcos zig:	-91	Ancho min frontal:	45.8
Largo del paladar:	-54.9	Ancho auricular:	63.7	Longitud facial:	-44
Ancho max. paladar:	-65.7	Ancho frontal:	50.6	Fusion craneal:	Unfused
Long nasion-basion:	0	Anch min interorb:	26.9	Nivel de fusion:	Unfused

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:	-83.9	83.5	Fusion de sinfisis:	Unfused
Long. maxima:	-86.7	86.6	Nivel de fusion:	Unfused
Altura rama mand:	-998	37.3		
Ancho rama mand:	-998	27.6		
Altura rama mand (Pm4):	18.1	18.3		

Felid

No de Elemento:	1984	Class:	Mammalia	Age:	Young Adult
Entierro:	E.6	Orden:	Carnivora	Sex:	Female
Localidad:	T.12, E.6	Familia:	Felidae		
Asociacion:	N3-31	Genus:	Puma		
Capa:	LXXXI	Specie:	concolor		

Notes: Craneo junto el esqueleto. La conservacion es buena en el craneo pero en los huesos largos es pobre. El craneo esta parcialmente deformado. La mandibula derecha esta destruida en area de los incisivos, sin embargo, estos se conservan completos. Se ubicaron dos huellas de corte en el craneo en el parietal derecho. Se tomo el canino derecho inferior y dos fragmentos de tibia para muestra de analisis quimico.

Modificaciones del superficie

		No de patologias:	1
Mod Presente?	True	Ubicacion pat:	
No de huellas de corte pr	4	# otras mod:	
Ubicacion de huellas:	Craneo	Ubicacion:	

Consolidantes

Uso consolidante?:	Si	Notas	
Que tipo?	2		

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	3.3	3.2	3.5	Der.	4	3.1	4
I2/	Izq.	4.4	3	3.8	Der.	4.3	3.4	4.3
I3/	Izq.	6	4.8	5.8	Der.	6.6	4.5	5.7
Cx/	Izq.	23.1	11.9	10.4	Der.	23.8	11.7	10.4
Pm2/	Izq.	1.8	2.8	5.3	Der.	3.1	3.5	4.3
Pm3/	Izq.	9.5	7.7	14.9	Der.	10.4	8.1	15.2
Pm4/	Izq.	12.3	10.2	21.5	Der.	11	10.4	21.6
M1/	Izq.	0			Der.	0		

Dientes de leche?: No

Notas:

Desgaste:

Felid

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	2.9	2.1	2.9	Der.	0		
I/2	Izq.	3.6	2.7	3.7	Der.	3.1	2.9	3.4
I/3	Izq.	4.5	3.6	4.4	Der.	3.9	4.8	4.3
C/x	Izq.	20.6	11	8	Der.	26.7	13.4	9.4
Pm/3	Izq.	8.6	6.4	13	Der.	8.3	6.4	13.4
Pm/4	Izq.	10.3	7.2	14.2	Der.	10.7	7.3	14.5
M/1	Izq.	11.5	7.7	16.6	Der.	11.4	7.5	16.7

Dientes de leche? No

Notas:

Desgaste:

Medidas Craneo:

Long maxima craneal:	-183	Ancho del craneo:	-63.2	Ancho biorbital:	-90.8
Longitud basal:	-171	Ancho arcos zig:	0	Ancho min frontal:	-47.5
Largo del paladar:	0	Ancho auricular:	-68.1	Longitud facial:	-65
Ancho max. paladar:	-77.7	Ancho frontal:	-71.2	Fusion craneal:	Unfused
Long nasion-basion:	-117	Anch min interorb:	-41.2	Nivel de fusion:	Barely Fu

Medidas Mandibula:

	Izq.	Der.		
Long de la mand:	116.4	0	Fusion de sinfisis:	Unfused
Long. maxima:	116.3	0	Nivel de fusion:	Unfused
Altura rama mand:	52.9	0		
Ancho rama mand:	37.9	39.6		
Altura rama mand (Pm4):	23.4	23		

Felid Deciduous teeth

Element # 2223

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	0			Der.	0		
ml1	Izq.	0			Der.	0		
ml2	Izq.	0			Der.	-998	-998	-998
ml3	Izq.	0			Der.	0		

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	3.3	2.2	3	Der.	3.4	2.2	3
i2	Izq.	4.4	3.2	3.3	Der.	3.4	3.1	3.2
i3	Izq.	5	4.3	4.1	Der.	4.9	4.5	4.3
cx	Izq.	9.4	5.9	4.2	Der.	10.6	5.5	4.8
ml1	Izq.	6.9	3.7	9.6	Der.	7.4	3.6	9.7
ml2	Izq.	9.3	4.9	14.1	Der.	-998	-998	-998
ml3	Izq.	0			Der.	0		

Notas

Desgaste

Felid Deciduous teeth

Element # 2228

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	0			Der.	0		
ml1	Izq.	0			Der.	0		
ml2	Izq.	0			Der.	0		
ml3	Izq.	0			Der.	0		

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	10.3	5.6	4.6	Der.	0		
ml1	Izq.	0			Der.	0		
ml2	Izq.	0			Der.	0		
ml3	Izq.	0			Der.	0		

Notas

Desgaste

Felid Deciduous teeth

Element # 2245

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	10.2	5	6.5	Der.	10.4	4.5	5.9
ml1	Izq.	3.5	3.6	4.7	Der.	3.3	3.8	3.9
ml2	Izq.	7.7	4.8	14.1	Der.	8.4	-998	-998
ml3	Izq.	3.8	5.5	5.3	Der.	-3.5	5.5	5.4

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	-9.7	-3.5	-5.5	Der.	-9.4	-3.7	-6.3
ml1	Izq.	6.8	3.8	9.4	Der.	6.3	4	9.2
ml2	Izq.	8.4	4.8	12.7	Der.	8.8	4.6	12.5
ml3	Izq.	0			Der.	0		

Notas

Desgaste

Felid Deciduous teeth

Element # 2243

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	0			Der.	0		
ml1	Izq.	4.5	2.4	5.8	Der.	4.8	-998	-5.3
ml2	Izq.	7	4.1	11.6	Der.	7.3	-998	12.2
ml3	Izq.	4.5	-998	8.7	Der.	4.5	-998	8.8

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	0			Der.	0		
ml1	Izq.	4.6	2.7	6.2	Der.	4.8	2.1	5.4
ml2	Izq.	-3.4	3.2	-7.2	Der.	6.5	3.4	7.8
ml3	Izq.	7.9	5.3	13.6	Der.	8	5.3	13.8

Notas

Desgaste

Felid Deciduous teeth

Element # 2244

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	3.4	3.1	3.6
i2	Izq.	3	3.3	2.1	Der.	4.3	3.1	2.6
i3	Izq.	5.8	4	3	Der.	6	3.2	3.1
cx	Izq.	13.4	5.9	3.2	Der.	0		
ml1	Izq.	4.4	2.5	7.2	Der.	3	2.2	7.1
ml2	Izq.	7.6	6.9	13.4	Der.	7.3	4.5	-11.3
ml3	Izq.	5.5	10.9	9.9	Der.	-5.3	8.3	-9

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	3.8	2.7	2.3
i2	Izq.	0			Der.	2.9	2.8	2.4
i3	Izq.	0			Der.	3	3.3	2.6
cx	Izq.	9.8	5.7	3.5	Der.	11.2	5.9	3.6
ml1	Izq.	4.1	2.9	5.7	Der.	5	2.3	6.6
ml2	Izq.	5.6	3.2	8	Der.	5.4	3.3	8.2
ml3	Izq.	8.9	6.1	14.4	Der.	10.1	5.5	14.3

Notas

Desgaste

Felid Deciduous teeth

Element # N4.31

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	7	4.3	4.6
cx	Izq.	0			Der.	0		
ml1	Izq.	0			Der.	0		
ml2	Izq.	0			Der.	0		
ml3	Izq.	0			Der.	8.6	5.3	16

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	8.6	3.8	4.5	Der.	-998	3.8	4.6
cx	Izq.	0			Der.	0		
ml1	Izq.	5.5	3.6	9.7	Der.	5.6	3.6	9.2
ml2	Izq.	8.8	4.8	14.3	Der.	8.9	4.9	14.3
ml3	Izq.	0			Der.	0		

Notas

Desgaste

Felid Deciduous teeth

Element # 167.1

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	9.1	4.6	6.7	Der.	0		
ml1	Izq.	0			Der.	0		
ml2	Izq.	8	5.6	15.6	Der.	-998	-998	-998
ml3	Izq.	-4.4	-998	6.2	Der.	-998	-998	-998

Notas: c, ml2, ml3 in erupcion

Desgaste: No

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	2.6	2.4	2.9	Der.	3.1	2.4	2.8
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	-998	-998	-998	Der.	-998	-998	-998
ml1	Izq.	-998	-2.6	9.3	Der.	0		
ml2	Izq.	-998	-998	-998	Der.	0		
ml3	Izq.	0			Der.	0		

Notas: i1, c, ml1, ml2

Desgaste: No

Felid Deciduous teeth

Element # 192, 189

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	1.5	1.6	1.5	Der.	1.3	1.2	1.4
i2	Izq.	1.9	1.6	1.7	Der.	2.3	1.5	1.3
i3	Izq.	3.7	2.8	2.9	Der.	4.8	2.6	2.8
cx	Izq.	-998	-998	-998	Der.	9	4.4	5.8
ml1	Izq.	7.6	5.7	15.2	Der.	1	1.6	1.7
ml2	Izq.	2.4	8.3	5.6	Der.	7.9	5.2	15.5
ml3	Izq.	1.1	1.8	2.3	Der.	2.6	7.4	5.6

Notas: Varias dientes permanentes formando en alveolar

Desgaste: Sin desgaste

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	2.3	2	2	Der.	2.7	1.7	2.1
i2	Izq.	3.4	2.4	2.1	Der.	3.2	2.7	2
i3	Izq.	0			Der.	0		
cx	Izq.	9.9	3.8	6.1	Der.	8.8	4	6.4
ml1	Izq.	6.6	3.6	9.1	Der.	6.9	3.6	9.3
ml2	Izq.	9.6	4.5	12.9	Der.	9.7	4.5	13.1
ml3	Izq.	0			Der.	0		

Notas: Varias dientes permanentes formando en alveolar

Desgaste: Sin desgaste

Felid Deciduous teeth

Element # 187

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	10.8	4.5	6.1	Der.	10.8	4.7	6.1
ml1	Izq.	0			Der.	0		
ml2	Izq.	0			Der.	0		
ml3	Izq.	0			Der.	0		

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	0			Der.	0		
ml1	Izq.	5.9	3.4	9.4	Der.	6.1	3.4	9.5
ml2	Izq.	8.2	5.6	16.2	Der.	8.3	5.2	-998
ml3	Izq.	0			Der.	0		

Notas

Desgaste

Felid Deciduous teeth

Element # 642

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.				Der.	6.1	3.1	3.8
i3	Izq.	0			Der.	0		
cx	Izq.	0			Der.	-998	4.1	6.2
ml1	Izq.	0			Der.	3.8	2.5	7.5
ml2	Izq.	0			Der.	-5	4.6	13
ml3	Izq.	5.2	10.6	11.9	Der.	5.6	10.9	11.1

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	7.1	3.6	4.7	Der.	7	3.6	4.7
i3	Izq.	8	4.8	5.9	Der.	7.6	4.8	5.9
cx	Izq.	11	3.4	5.4	Der.	-998	3.8	5.7
ml1	Izq.	3.8	2.8	6.9	Der.	3.2	2.7	6.9
ml2	Izq.	-998	-998	-998	Der.	-998	-998	-9.5
ml3	Izq.				Der.	-7.3	5.3	14.5

Notas

Desgaste

Felid Deciduous teeth

Element # PPS209

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	9.3	3.5	5.3	Der.	9.6	3.6	5.2
ml1	Izq.	3.2	2	6.2	Der.	2.6	2.4	5.9
ml2	Izq.	6.5	4.6	12	Der.	6.5	4.2	12.6
ml3	Izq.	3.9	10.5	9.1	Der.	4	10.5	9.5

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	4.6	3.1	2.6	Der.	0		
cx	Izq.	9.3	3.2	5	Der.	8.5	3.3	5
ml1	Izq.	3.6	2.6	6.1	Der.	3.6	2.6	6.5
ml2	Izq.	5.3	2.9	7.8	Der.	5.7	3.1	7.8
ml3	Izq.	7.1	4.4	14.3	Der.	7.2	4.7	13.9

Notas

Desgaste

Felid Deciduous teeth

Element # 270

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	9.9	4.9	6.1	Der.	9.9	4.4	5.1
ml1	Izq.	0			Der.	0		
ml2	Izq.	0			Der.	0		
ml3	Izq.	8.1	6.3	-998	Der.	0		

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	0			Der.	0		
ml1	Izq.	0			Der.	0		
ml2	Izq.	0			Der.	0		
ml3	Izq.	0			Der.	0		

Notas

Desgaste

Felid Deciduous teeth

Element # 1960

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	3.5	3.7	2.8	Der.	3.4	2.7	2.4
i2	Izq.	0			Der.	0		
i3	Izq.	4.2	2.9	2.7	Der.	3.8	2.9	2.8
cx	Izq.	11.1	4.6	5.8	Der.	10.5	5.2	5.9
ml1	Izq.	1.6	2.4	2.9	Der.	1.2	2.6	3
ml2	Izq.	7.7	4.7	14.9	Der.	8.2	4.8	15.3
ml3	Izq.	2.7	8.3	5.8	Der.	3.9	5.6	6.3

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	2.8	3	3	Der.	2.7	3.2	2.9
i3	Izq.	4.2	4	3.8	Der.	4.1	4.2	4
cx	Izq.	0			Der.	-998	-998	-998
ml1	Izq.	5.9	3.5	9.8	Der.	6.2	3.6	6
ml2	Izq.	8.6	5.1	12.6	Der.	8.8	-4.8	12.1
ml3	Izq.	0			Der.	0		

Notas

Desgaste

Felid Deciduous teeth

Element # 2043

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	1.5	2	1.2	Der.	2.3	2	1.5
i2	Izq.	2	2	1.6	Der.	3.9	2.1	1.9
i3	Izq.	3.8	3.3	3.1	Der.	3.8	2.9	3.1
cx	Izq.	8.2	5.9	4.7	Der.	7.6	5.8	3.4
ml1	Izq.	0			Der.	0		
ml2	Izq.	8.6	5.1	16.1	Der.	7.4	4.8	16
ml3	Izq.	0			Der.	2.9	5.3	4.4

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	2.2	1.6	1.4	Der.	1.3	1.5	1.1
i2	Izq.	1.8	1.4	1.6	Der.	1.4	1.4	1.3
i3	Izq.	2.8	2	2	Der.	2.2	2.1	2.6
cx	Izq.	9.3	5.4	4	Der.	9.4	6.4	3.6
ml1	Izq.	6.4	3.5	9.4	Der.	6	3.5	9.2
ml2	Izq.	9.1	4.7	13.5	Der.	-8.8	4.7	-10.3
ml3	Izq.	0			Der.	0		

Notas

Desgaste

Felid Deciduous teeth

Element # 2068

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	0			Der.	0		
ml1	Izq.	0			Der.	0		
ml2	Izq.	8	4.5	-11.5	Der.	0		
ml3	Izq.	0			Der.	0		

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	0			Der.	0		
ml1	Izq.	0			Der.	0		
ml2	Izq.	0			Der.	0		
ml3	Izq.	0			Der.	0		

Notas

Desgaste

Felid Deciduous teeth

Element # 2071

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	2.3	2	1.8	Der.	1.6	1.3	1.2
i2	Izq.	2.3	2.1	1.7	Der.	0		
i3	Izq.	4.2	3.1	2.7	Der.	3.9	3.2	2.8
cx	Izq.	0			Der.	9.9	5.5	4.6
ml1	Izq.	0			Der.	3.1	2.4	1.8
ml2	Izq.	-998	-998	-998	Der.	7.9	6	15.3
ml3	Izq.	3.5	5	5.6	Der.	0		

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	2.2	1.9	1.8
i3	Izq.	2.4	2.4	2.6	Der.	2.6	2.1	2.1
cx	Izq.	8	6.7	4.2	Der.	-7.6	-7.3	4.2
ml1	Izq.	6.2	3.6	9.2	Der.	6.2	3.5	9.2
ml2	Izq.	8.9	4.8	13.9	Der.	-9.7	6.4	-15.6
ml3	Izq.	0			Der.	0		

Notas

Desgaste

Felid Deciduous teeth

Element # 2195

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	0		
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	6.6	5.8	4.8	Der.	10.1	5.9	6.1
ml1	Izq.	3.2	3.7	5.5	Der.	2.9	3.7	3.9
ml2	Izq.	0			Der.	7.2	5.4	16.4
ml3	Izq.	0			Der.	0		

Notas

Desgaste:

Medidas dentales (mandibluares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
i1	Izq.	0			Der.	1.5	2.7	2
i2	Izq.	0			Der.	0		
i3	Izq.	0			Der.	0		
cx	Izq.	0			Der.	0		
ml1	Izq.	0			Der.	5.3	3.6	9.2
ml2	Izq.	0			Der.	0		
ml3	Izq.	0			Der.	0		

Notas

Desgaste

Feline Post-crania

Elemento: 1818

Medidas de huesos largos

	Izq	Der
Humero	179	180
Radio	158	155
Ulna	189	190
Femur	-236	0
Tibia	214	215
Fibula	-189	-999
Long bone fusion:	6	

Medidas de huesos planos

	Izq	Der
Escapula	0	0
Pelvis	0	

Medidas de huesos metapodiales

Metacarpos	Izq	Der	Metatarsos	Izq	Der
I	24	24.1	I		
II	62.4	-999	II	77.3	77.1
III	69	-999	III	86.3	86.3
IV	65.4	64.8	IV	85.5	85.6
V	52.1	52.8	V	74.7	74.7

Fusion de metapodi: 1

Medidas de vertebras (long.)

Atlas:	-12.2	1a Dorsal:	15.9	1a Lumbar:	28	6a Cauda	29.8
Axis:	39.5	2a Dorsal:	14.5	2a Lumbar:	30.2	7a Cauda	37
Scaro (Long):	-90	3a Dorsal:	19.6	3a Lumbar:	32.3	8a Cauda	38.3
Sacro (Ancho):		4a Dorsal:	20	4a Lumbar:	35.9	9a Cauda	37.6
3a Cerv:	24.1	5a Dorsal:	18.3	5a Lumbar:	34.4	10a Cauda	38
4a Cerv:	18.2	6a Dorsal:	15.4	6a Lumbar:	36.2	11a Cauda	35.6
5a Cerv:	23	7a Dorsal:	17.1	7a Lumbar:	0	12a Cauda	-35.7
6a Cerv:	19.8	8a Dorsal:	16			13a Cauda	38.1
7a Cerv:	17.4	9a Dorsal:	15.2	1a Caudal:	-14.6	14a Cauda	33.4
		10a Dorsal:	0	2a Caudal:	26.3	15a Cauda	30.7
		11 Dorsal:	22.6	3a Caudal:	21.9	16a Cauda	27.9
		12 Dorsal:	24.8	4a Caudal:	0	17a Cauda	25.1
		13 Dorsal:	25.5	5a Caudal:	33.9	18a Cauda	22.3
						19a Cauda	19.5
						20a Cauda	16.8

Fusion de vertebras: 6

Feline Post-crania

Elemento: 1887

Medidas de huesos largos

	Izq	Der
Humero	-998	-998
Radio	153.2	-998
Ulna	-998	-998
Femur	235	224
Tibia	-998	-998
Fibula	-998	-998
Long bone fusion:	7	

Medidas de huesos planos

	Izq	Der
Escapula	0	0
Pelvis	154	154

Medidas de huesos metapodiales

Metacarpos	Izq	Der	Metatarsos	Izq	Der
I	0	-998	I		-998
II	0	-998	II	0	-998
III	0	-998	III	0	-998
IV	0	-998	IV	0	-998
V	0	-998	V	0	-998

Fusion de metapodi: 1

Medidas de vertebras (long.)

Atlas:	0	1a Dorsal:	0	1a Lumbar:	0	6a Cauda	35.1
Axis:		2a Dorsal:	0	2a Lumbar:	0	7a Cauda	0
Scaro (Long):	0	3a Dorsal:	0	3a Lumbar:	-38.4	8a Cauda	0
Sacro (Ancho):		4a Dorsal:	0	4a Lumbar:	-39.9	9a Cauda	0
3a Cerv:	0	5a Dorsal:	0	5a Lumbar:	-29.4	10a Cauda	43.3
4a Cerv:	0	6a Dorsal:	0	6a Lumbar:	-31.3	11a Cauda	41.3
5a Cerv:	0	7a Dorsal:	0	7a Lumbar:	0	12a Cauda	0
6a Cerv:		8a Dorsal:	0			13a Cauda	0
7a Cerv:		9a Dorsal:	0	1a Caudal:	-18.7	14a Cauda	0
		10a Dorsal:	0	2a Caudal:	19.7	15a Cauda	0
		11 Dorsal:	0	3a Caudal:	23.6	16a Cauda	0
		12 Dorsal:	0	4a Caudal:	27.1	17a Cauda	0
		13 Dorsal:	0	5a Caudal:	31.1	18a Cauda	0
						19a Cauda	0
						20a Cauda	

Fusion de vertebras: 7

Feline Post-crania

Elemento: 1984

Medidas de huesos largos

	Izq	Der
Humero		0
Radio	159	0
Ulna	0	0
Femur	0	0
Tibia	0	0
Fibula	0	0

Long bone fusion: 5

Medidas de huesos planos

	Izq	Der
Escapula	0	0
Pelvis	0	

Medidas de huesos metapodiales

Metacarpos	Izq	Der	Metatarsos	Izq	Der
I	0	0	I		
II	0	0	II	0	0
III	0	0	III	0	0
IV	-66.7	0	IV	0	0
V	0	0	V	0	0

Fusion de metapodi 99

Medidas de vertebras (long.)

Atlas:	0	1a Dorsal:	0	1a Lumbar:	0	6a Cauda	0
Axis:		2a Dorsal:	0	2a Lumbar:	0	7a Cauda	0
Scaro (Long):	0	3a Dorsal:	0	3a Lumbar:	0	8a Cauda	0
Sacro (Ancho):		4a Dorsal:	0	4a Lumbar:	0	9a Cauda	0
3a Cerv:	0	5a Dorsal:	0	5a Lumbar:	0	10a Cauda	0
4a Cerv:	0	6a Dorsal:	0	6a Lumbar:	0	11a Cauda	0
5a Cerv:	0	7a Dorsal:	0	7a Lumbar:	0	12a Cauda	0
6a Cerv:		8a Dorsal:	0			13a Cauda	0
7a Cerv:		9a Dorsal:	0	1a Caudal:	0	14a Cauda	0
		10a Dorsal:	0	2a Caudal:	0	15a Cauda	0
		11 Dorsal:	0	3a Caudal:	0	16a Cauda	0
		12 Dorsal:	0	4a Caudal:	0	17a Cauda	0
		13 Dorsal:	0	5a Caudal:	0	18a Cauda	0
						19a Cauda	0
						20a Cauda	

Fusion de vertebras: 99

Feline Post-crania

Elemento: 1991.1

Medidas de huesos largos

	Izq	Der
Humero		0
Radio	0	103.6
Ulna	0	113.4
Femur	157	155
Tibia	0	-130
Fibula	0	0

Long bone fusion: 6

Medidas de huesos planos

	Izq	Der
Escapula	0	-86
Pelvis	0	

Medidas de huesos metapodiales

Metacarpos	Izq	Der	Metatarsos	Izq	Der
I	0	0	I		
II	0	0	II	0	0
III	0	0	III	0	0
IV	0	0	IV	0	0
V	0	15.7	V	0	0

Fusion de metapodi 99

Medidas de vertebras (long.)

Atlas:	0	1a Dorsal:	0	1a Lumbar:	20	6a Cauda	15.6
Axis:		2a Dorsal:	0	2a Lumbar:	24.7	7a Cauda	15.1
Scaro (Long):	0	3a Dorsal:	0	3a Lumbar:	20.6	8a Cauda	-20.2
Sacro (Ancho):		4a Dorsal:	13.1	4a Lumbar:	0	9a Cauda	21.4
3a Cerv:	0	5a Dorsal:	12.9	5a Lumbar:	24.1	10a Cauda	21.7
4a Cerv:	0	6a Dorsal:	14	6a Lumbar:	21.6	11a Cauda	21.7
5a Cerv:	0	7a Dorsal:	13.5	7a Lumbar:	23.1	12a Cauda	21
6a Cerv:		8a Dorsal:	13.1			13a Cauda	20.6
7a Cerv:		9a Dorsal:	14.1	1a Caudal:	0	14a Cauda	21
		10a Dorsal:	-12.2	2a Caudal:	11.6	15a Cauda	20
		11 Dorsal:	16.1	3a Caudal:	13.7	16a Cauda	18.7
		12 Dorsal:	18	4a Caudal:	12.5	17a Cauda	17.2
		13 Dorsal:	18.5	5a Caudal:	17.6	18a Cauda	-13
						19a Cauda	14
						20a Cauda	12.6

Fusion de vertebras: 7

Feline Post-crania

Elemento: 154.1

Medidas de huesos largos

	Izq	Der
Humero	-998	-998
Radio	-160	-998
Ulna	207	207
Femur	-998	230
Tibia	-998	-998
Fibula	-998	170

Long bone fusion: 5

Medidas de huesos planos

	Izq	Der
Escapula	-998	-998
Pelvis	178	180

Medidas de huesos metapodiales

Metacarpos	Izq	Der	Metatarsos	Izq	Der
I	24.3	25.9	I		
II	71.2	71.6	II	88.8	88.8
III	81.4	80.4	III	-998	100
IV	76.6	76.8	IV	98.3	99.3
V	58.9	60.4	V	84.5	85.9

Fusion de metapodi: 3

Medidas de vertebras (long.)

Atlas:	38.7	1a Dorsal:	21	1a Lumbar:	30.4	6a Cauda	41
Axis:	34.3	2a Dorsal:	20.4	2a Lumbar:	32.8	7a Cauda	42.8
Scaro (Long):	0	3a Dorsal:	19.5	3a Lumbar:	36	8a Cauda	43.4
Sacro (Ancho):		4a Dorsal:	19.5	4a Lumbar:	37.9	9a Cauda	43.4
3a Cerv:	26.3	5a Dorsal:	19.8	5a Lumbar:	32.7	10a Cauda	43.3
4a Cerv:	26.1	6a Dorsal:	20.8	6a Lumbar:	39.7	11a Cauda	42
5a Cerv:	26.5	7a Dorsal:	20.2	7a Lumbar:	40.1	12a Cauda	39.6
6a Cerv:	24.2	8a Dorsal:	20.1			13a Cauda	36.7
7a Cerv:		9a Dorsal:	21	1a Caudal:	23.9	14a Cauda	33.6
		10a Dorsal:	-18.2	2a Caudal:	26.2	15a Cauda	25.3
		11 Dorsal:	21.1	3a Caudal:	29.2	16a Cauda	22.7
		12 Dorsal:	23.3	4a Caudal:	35.7	17a Cauda	0
		13 Dorsal:	25	5a Caudal:	38	18a Cauda	0
						19a Cauda	0
						20a Cauda	

Fusion de vertebras: 0

Feline Post-crania

Elemento: 143

Medidas de huesos largos

	Izq	Der
Humero	-998	186
Radio	164	-998
Ulna	202	195
Femur	222	225
Tibia	207	212
Fibula	-998	-998

Long bone fusion: 5

Medidas de huesos planos

	Izq	Der
Escapula	-998	-998
Pelvis	176	177

Medidas de huesos metapodiales

Metacarpos	Izq	Der	Metatarsos	Izq	Der
I	24.5	25.7	I		
II	71.2	71.8	II	-998	85.5
III	79.3	78.5	III	94.7	95.8
IV	75	74.8	IV	93.7	93.4
V	59.5	58.9	V	-998	85.1

Fusion de metapodi: 5

Medidas de vertebras (long.)

Atlas:	36.2	1a Dorsal:	0	1a Lumbar:	31.6	6a Cauda	31.9
Axis:	-998	2a Dorsal:	0	2a Lumbar:	34.8	7a Cauda	38.7
Scaro (Long):	0	3a Dorsal:	22	3a Lumbar:	35.3	8a Cauda	41.2
Sacro (Ancho):		4a Dorsal:	-16.4	4a Lumbar:	35.2	9a Cauda	41.9
3a Cerv:	-18.5	5a Dorsal:	-18.4	5a Lumbar:	34.2	10a Cauda	42.1
4a Cerv:	22.2	6a Dorsal:	18.2	6a Lumbar:	31.7	11a Cauda	41.8
5a Cerv:	20.2	7a Dorsal:	-17.3	7a Lumbar:	-27.8	12a Cauda	41.6
6a Cerv:	21.7	8a Dorsal:	-17.5			13a Cauda	39.7
7a Cerv:		9a Dorsal:	18.9	1a Caudal:	18.7	14a Cauda	37.7
		10a Dorsal:	25.2	2a Caudal:	19.9	15a Cauda	35.7
		11 Dorsal:	28.1	3a Caudal:	24.3	16a Cauda	30.2
		12 Dorsal:	0	4a Caudal:	28.3	17a Cauda	24.4
		13 Dorsal:	0	5a Caudal:	35.8	18a Cauda	22.3
						19a Cauda	14.8
						20a Cauda	12.7

Fusion de vertebras: 5

Feline Post-crania

Elemento: 167.1

Medidas de huesos largos

	Izq	Der
Humero		0
Radio	0	0
Ulna	0	0
Femur	0	0
Tibia	0	0
Fibula	0	0
Long bone fusion:		

Medidas de huesos planos

	Izq	Der
Escapula	0	0
Pelvis	0	

Medidas de huesos metapodiales

Metacarpos	Izq	Der	Metatarsos	Izq	Der
I	0	20	I		
II	-998	49.2	II	0	0
III	-998	55.8	III	0	0
IV	-998	53	IV	0	0
V	41.1	-998	V	0	0

Fusion de metapodi 7

Medidas de vertebras (long.)

Atlas:	0	1a Dorsal:	0	1a Lumbar:	0	6a Cauda	0
Axis:		2a Dorsal:	0	2a Lumbar:	0	7a Cauda	0
Scaro (Long):	0	3a Dorsal:	0	3a Lumbar:	0	8a Cauda	0
Sacro (Ancho):		4a Dorsal:	0	4a Lumbar:	0	9a Cauda	0
3a Cerv:	0	5a Dorsal:	0	5a Lumbar:	0	10a Cauda	0
4a Cerv:	0	6a Dorsal:	0	6a Lumbar:	0	11a Cauda	0
5a Cerv:	0	7a Dorsal:	0	7a Lumbar:	0	12a Cauda	0
6a Cerv:		8a Dorsal:	0			13a Cauda	0
7a Cerv:		9a Dorsal:	0	1a Caudal:	0	14a Cauda	0
		10a Dorsal:	0	2a Caudal:	0	15a Cauda	0
		11 Dorsal:	0	3a Caudal:	0	16a Cauda	0
		12 Dorsal:	0	4a Caudal:	0	17a Cauda	0
		13 Dorsal:	0	5a Caudal:	0	18a Cauda	0
						19a Cauda	0
						20a Cauda	

Fusion de vertebras: 0

Feline Post-crania

Elemento: 1639

Medidas de huesos largos

	Izq	Der
Humero	175.3	177.7
Radio	154.3	155.5
Ulna	-998	180.8
Femur	0	0
Tibia	0	-998
Fibula	0	0
Long bone fusion:	7	

Medidas de huesos planos

	Izq	Der
Escapula	-998	-998
Pelvis	0	

Medidas de huesos metapodiales

Metacarpos	Izq	Der	Metatarsos	Izq	Der
I	-998	22.7	I		
II	-998	-998	II	-998	-998
III	-998	-998	III	-998	-998
IV	-64.3	64	IV	-998	66.7
V	48.1	-998	V	-998	-998

Fusion de metapodi 7

Medidas de vertebras (long.)

Atlas:	-998	1a Dorsal:	0	1a Lumbar:	0	6a Cauda	0
Axis:	-28.7	2a Dorsal:	0	2a Lumbar:	0	7a Cauda	0
Scaro (Long):	0	3a Dorsal:	0	3a Lumbar:	0	8a Cauda	0
Sacro (Ancho):		4a Dorsal:	0	4a Lumbar:	0	9a Cauda	0
3a Cerv:	0	5a Dorsal:	0	5a Lumbar:	0	10a Cauda	0
4a Cerv:	0	6a Dorsal:	0	6a Lumbar:	0	11a Cauda	0
5a Cerv:	0	7a Dorsal:	0	7a Lumbar:	0	12a Cauda	0
6a Cerv:		8a Dorsal:	0			13a Cauda	0
7a Cerv:		9a Dorsal:	0	1a Caudal:	0	14a Cauda	0
		10a Dorsal:	0	2a Caudal:	0	15a Cauda	0
		11 Dorsal:	0	3a Caudal:	0	16a Cauda	0
		12 Dorsal:	0	4a Caudal:	0	17a Cauda	0
		13 Dorsal:	0	5a Caudal:	0	18a Cauda	0
						19a Cauda	0
						20a Cauda	

Fusion de vertebras: 6

Appendix E: Canid data forms

Canid

No de Elemento:	575.1	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Juvenile/Adult
Asociacion:	Animal VIII, SE	Familia:	Canidae	Sex:	-998

Notes: Craneo y mandibula totalmente destruido. Todos piezas dentarios permanentes. No se nota desgaste en los dientes por lo tanto se trata de un individuo juvenile o adulto joven. Junto con este ejemplar salio una garra de felino (Ele 575.2) y un hueso ocular de un ave posiblemente de una aguila (Ele 572.3).

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido, se pego p

Elementos: Craneo y mandibula

Notas Elementos: Muy fragmentado, casi solo se reconocio unos fragmentos de basiocipital y la dentadura.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	10.5	6.3	6.4	Der.	0		
I2/	Izq.	9.9	6.6	6.4	Der.	-11.3	-998	6.7
I3/	Izq.	-998	-7.1	-998	Der.	14.3	7.9	9.2
Cx/	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm1/	Izq.	5.9	5.4	-998	Der.	0		
Pm2/	Izq.	7.8	5.1	12.1	Der.	7.7	5.5	11.7

Canid

Pm3/	Izq.	8.1	5.9	14.5	Der.	8.3	6.3	15
Pm4/	Izq.	15.9	10.4	23.8	Der.	14.2	-10.4	24.7
M1	Izq.	0			Der.	-998	-998	-998
M2	Izq.	4.5	10.9	8.2	Der.	0		

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	7	3.8	5.1	Der.	0		
I/2	Izq.	11.3	6.8	6.9	Der.	10.6	6.9	6.9
I/3	Izq.	0			Der.	0		
C/x	Izq.	24.6	7.5	13	Der.	21.4	-998	12.5
Pm/1	Izq.	0			Der.	4.4	5	-998
Pm/2	Izq.	7.8	5.2	13.4	Der.	7.7	6.2	13.4
Pm/3	Izq.	8.3	5.5	14.1	Der.	8.3	5.7	13.8
Pm4/	Izq.	10	6.4	14.9	Der.	10	7	15
M1	Izq.	17.5	11	28.2	Der.	0		
M2	Izq.	8.1	8.7	11.7	Der.	0		
M3	Izq.				Der.	3.42	5.2	5.6

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cra		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

Izq. Der.

Canid

Longitud de mand	0	0
Longitud max:	0	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

No de Elemento:	579.1	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Adult
Asociacion:	Animal XII, NE	Familia:	Canidae	Sex:	-998

Notes: Individuo con dientes permanentes y desgaste en casi todos los dientes, por lo tanto es de un adulto medio entre 3-5 anos de edad. Hay un incisivo 3 superior izquierda que se repite que registramos como Elemento 579.2. Tambien incluye un falange y una garra de canido. Incluye tres garras de felino mezclado con estos materiales. Asociado a animal XII.

Modificaciones del superficie

Mod Presente?	True	# de patologias:	
# de huellas:	5	Ubicacion de pat:	
Ubicacion:	cuerpo de la m	# de mod	
		Ubicacion mod.	

Notas: Fractura en la maxila, mandibula y molar 1 superior izquierda en derecha. Huellas de corte en el cuerpo de la mandibula tambien.

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido, se pego p

Elementos: Craneo y mandibula

Notas Elementos: Craneo preparado con solo la parte de ocico de animal, quiere decir parte maxilar y nasal. El incisivo 2 superior izquierda se ve que fue fragmentado o desgastado chueco cuando el animal fue vivo. Dos dientes presentan fracturas antiguas, probablemente fracturado durante la elaboracion de craneo o uso de este craneo. Fractura antigua en la parte maxilar. Mandibula praparada se ve fracturas antiguas donde se quito la rama mandibular dejando solo la dentacion con el cuerpo de la mandibula. Probablemente quitaron la piel de esta mandibula por la presencia de unas huellas de corte sobre el cuerpo de la mandibula. Tambien presenta fracturas antiguas en la mandibula.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long

Canid

I1/	**Izq.**	8	5.2	5.9	**Der.**	8.5	5.5	5.7
I2/	**Izq.**	-998	7	7.1	**Der.**	11	6.5	7
I3/	**Izq.**	11.5	7.1	8.7	**Der.**	13	7.3	8.3
Cx/	**Izq.**	-998	8.5	12.4	**Der.**	25.2	8.1	12.3
Pm1/	**Izq.**	5.4	5.3	7.2	**Der.**	6.1	5.2	6.6
Pm2/	**Izq.**	5.8	5.5	13.2	**Der.**	5.9	5.4	13.5
Pm3/	**Izq.**	6.6	6.1	14.2	**Der.**	5.7	5.7	14.2
Pm4/	**Izq.**	-998	10.1	-998	**Der.**	-998	-998	-998
M1	**Izq.**	0			**Der.**	0		
M2	**Izq.**	5.3	12.7	8.3	**Der.**	0		

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	**Izq.**	6.1	3.4	4.8	**Der.**	-998	-998	4.1
I/2	**Izq.**	7.4	4.8	6.2	**Der.**	-998	-998	6.2
I/3	**Izq.**	-998	-998	-998	**Der.**	-998	-998	6.6
C/x	**Izq.**	-998	7.9	11.9	**Der.**	-998	7.6	11.8
Pm/1	**Izq.**	4.3	4.8	4.8	**Der.**	3.9	4.5	5
Pm/2	**Izq.**	5.7	5.4	10.5	**Der.**	5.7	4.5	9.9
Pm/3	**Izq.**	6.4	6.1	12.7	**Der.**	6.3	6.2	12.8
Pm4/	**Izq.**	9	7.4	14.6	**Der.**	-998	8.2	14.1
M1	**Izq.**	15.2	11	26.2	**Der.**	-14.6	10.5	25.5
M2	**Izq.**	6.6	8.3	11.3	**Der.**	-6.3	-998	11
M3	**Izq.**				**Der.**			

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cr	-998	Ancho del craneo:	-998	Ancho biorbital:	-998

Canid

Longitud basal:	-998	Ancho de los arcos z	-998	Ancho minimo front	-998
Largo del paladar:	-112.3	Ancho auricular:	-998	Longitud facial:	-998
Ancho maximo del p	-998	Ancho frontal:	-998	Curva nasal:	-998
Longitud nasion-bas	-998	Ancho minimo inter	-998	Fuscion craneal:	-998
				Nivel de fusion de cr	-998

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	-998	-998
Longitud max:	-998	-998
Altura rama mand	-998	-998
Ancho rama mand	-998	-998
Altura rama mand M1	31.9	32.9

Canid

No de Elemento:	213.1	Capa:	LXXI	Genus:	Canis
Entierro:	E.2	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.2	Orden:	Carnivora	Age:	Juvenile
Asociacion:	E.2.13, Ext.E	Familia:	Canidae	Sex:	Male

Notes: Juvenil 6-9 meses. Todos dientes son permanentes pero su craneo y huesos largos no esta fusionado. Se identifico la presencia de os penis, por lo tanto se trata de un macho. Individuo completo y de buen estado de conservacion.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: No?

Que tipo?

Notas sobre consoli: No se ve que se utilizo consolidante pero n

Elementos: Individuo completo

Notas Elementos: Individuo completo auqneu algunos estan fragmentado. Sin ningun modificacion del superficie.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	9.3	5.8	6
I2/	Izq.	11.6	7.2	6.6	Der.	11.2	6.5	7.3
I3/	Izq.	12.6	6.1	7.8	Der.	12.7	6.2	7.1
Cx/	Izq.	23.8	7	11.7	Der.	23	7.1	11
Pm1/	Izq.	5.2	5.2	5.9	Der.	5.4	-998	4.8
Pm2/	Izq.	7.2	5.6	11.3	Der.	7.3	5.5	11.1
Pm3/	Izq.	7.4	6.5	14.3	Der.	7.7	6.5	14.6

Canid

Pm4/	Izq.	13.9	9.6	24	Der.	14.6	9.6	24.3
M1	Izq.	9.7	-18.3	15.4	Der.	10.1	19.9	15.2
M2	Izq.	2.9	10.6	6.9	Der.	4.6	9.9	7.6

Dientes de leche? No — Desgaste : No desgastado

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	7.3	3.7	5	Der.	7.1	3.5	5
I/2	Izq.	7.8	4.9	6	Der.	8	4.6	5.8
I/3	Izq.	10.5	6.1	6.6	Der.	10	6.3	6.8
C/x	Izq.	22.2	7.5	10.3	Der.	22	7.7	11.8
Pm/1	Izq.	4.8	4.5	5.2	Der.	0		
Pm/2	Izq.	7.2	5.6	13.1	Der.	7.5	5.3	13.3
Pm/3	Izq.	7.6	6.1	13	Der.	7.5	5.3	13.3
Pm4/	Izq.	9.5	7.1	13.8	Der.	9.6	7.1	14.2
M1	Izq.	14.3	10.2	26.3	Der.	14.5	10.3	26.3
M2	Izq.	7.1	7.5	10.7	Der.	7.3	7.3	10
M3	Izq.	3.3	5	5	Der.	3.4	4.9	5.1

Dientes de leche? No — Desgaste: No desgastado

Notas

Medidas Craneo:

Longitud maxima cra	-998	Ancho del craneo:	64.8	Ancho biorbital:	-998
Longitud basal:	-998	Ancho de los arcos z	-998	Ancho minimo front	-47.7
Largo del paladar:	-998	Ancho auricular:	-998	Longitud facial:	-80.8
Ancho maximo del p	-73.26	Ancho frontal:	-998	Curva nasal:	-998
Longitud nasion-bas	-998	Ancho minimo inter	28.2	Fuscion craneal:	3
				Nivel de fusion de cr	7

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	-998	-998

Canid

Longitud max:	-998	-998
Altura rama mand	-998	-998
Ancho rama mand	-998	-33.3
Altura rama mand M1	21.6	21.4

Canid

No de Elemento:	746	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Adult
Asociacion:	SE	Familia:	Canidae	Sex:	-998

Notes: Fragmentos de dientes de animal encontrados cerca del craneo de individuo 3-B, separado en laboratorio. Puede corresponder a otro elemento?

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consolid No se sabe, quizas resistol deluido.

Elementos: Cranial Bone

Notas Elementos: Muy fragmentado, tanto qu no se pudo identificar ningun fragmento craneal, solo se noto presencia de huesos de la mandibula pero tampoco se identifico de que parte exactamente. Solo se reconstryo denticion.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	6.7	3.6	-998	Der.	0		
I2/	Izq.	10.3	-998	-998	Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	-999	-999	-999	Der.	0		
Pm1/	Izq.	0			Der.	5.6	5.2	6.8
Pm2/	Izq.	7.5	5.5	12.4	Der.	7.2	4.8	12.7
Pm3/	Izq.	10.4	-998	-998	Der.	7.7	5.9	14.3

Canid

Pm4/	**Izq.**	-998	-998	-998	**Der.**	12.8	9	21.8
M1	**Izq.**	0			**Der.**	9.4	15.7	14.7
M2	**Izq.**	0			**Der.**	4.4	11	7.8

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	**Izq.**	0			**Der.**	0		
I/2	**Izq.**	0			**Der.**	0		
I/3	**Izq.**	0			**Der.**	0		
C/x	**Izq.**	0			**Der.**	0		
Pm/1	**Izq.**	0			**Der.**	0		
Pm/2	**Izq.**	0			**Der.**	0		
Pm/3	**Izq.**	0			**Der.**	0		
Pm4/	**Izq.**	0			**Der.**	0		
M1	**Izq.**	0			**Der.**	0		
M2	**Izq.**	0			**Der.**	0		
M3	**Izq.**				**Der.**			

Dientes de leche? Desgaste

Notas

Medidas Craneo:

Longitud maxima cra		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

	Izq.	**Der.**
Longitud de mand	0	0

Canid

Longitud max:	0	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

No de Elemento:	2221	Capa:	LXXXI	Genus:	Canis
Entierro:	E.6	Class:	Mammalia	Specie:	lupus
Localidad:	T.12, E.6	Orden:	Carnivora	Age:	Young Adult
Asociacion:		Familia:	Canidae	Sex:	-998

Notes: Craneo destruido, la region del neurocraneo totalmente aplastada, en la cual se encontro una navajilla de obsidiana y una base de estuco blanco. Tambien se encontro una oreja de vasija de barro. El maxilar izquierdo, a la altura de los nasales, se encontro una capa de estuco blanco.

Modificaciones del superficie

Mod Presente?	True	# de patologias:	
# de huellas:	3	Ubicacion de pat:	
Ubicacion:	Craneo	# de mod	
		Ubicacion mod.	

Notas: Hueso frontal lado derecha

Consolidantes

Uso consolidante?: Si

Que tipo? Reconos 110+220, Resistol 850

Notas sobre consoli

Elementos: Craneo y mandibula

Notas Elementos: Ambas mandibulas se encuentran reconstruido a un 25%, hasta donde es posible ubicar framentos de hueso. La mandibula derecha esta mas completa, mientras que la izquierda esta mas destruida, ambas con sus piezas dentales excepto incisivos.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	10.4	5.7	6.1	Der.	10.5	5.7	6.2
I2/	Izq.	12.9	8.1	7.5	Der.	12.8	8	7.6
I3/	Izq.	14	8.7	9.5	Der.	14.2	8.9	9.9
Cx/	Izq.	28.1	8.9	13	Der.	28	8.9	13.1
Pm1/	Izq.	6.2	5.6	7.9	Der.	6.4	5.2	7.4
Pm2/	Izq.	7.7	5.5	13.7	Der.	7.6	5.3	13.7
Pm3/	Izq.	8	6.2	15	Der.	8	6.4	15.1
Pm4/	Izq.	15	9.8	25.1	Der.	15	10	25.1
M1	Izq.	10.8	23.5	17	Der.	10.9	23.6	17
M2	Izq.	5.4	11.9	8.2	Der.	5.3	11.6	8.4

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	25.2	12.2	13.1	Der.	25.4	12.2	13.1
Pm/1	Izq.	5.8	4.9	5.9	Der.	5.7	4.9	5.8
Pm/2	Izq.	7.4	5.6	11.6	Der.	7.4	5.4	11.9
Pm/3	Izq.	8.5	5.7	13.6	Der.	8.6	5.9	13.7
Pm4/	Izq.	10	7.2	15.5	Der.	10.1	7.1	15.6
M1	Izq.	16.5	10.5	28.4	Der.	16.6	10.9	28.2
M2	Izq.	8	9	11.9	Der.	8	9.2	11.8
M3	Izq.	3.9	5.1	5.1	Der.			

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cra		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	3
				Nivel de fusion de cr	4

Medidas Mandibula:

Canid

No de Elemento:	2224	Capa:	LXXXI	Genus:	Canis
Entierro:	E.6	Class:	Mammalia	Specie:	lupus
Localidad:	T.12, E.6	Orden:	Carnivora	Age:	Adult
Asociacion:	N3-33	Familia:	Canidae	Sex:	-998

Notes: Craneo totalmente destruido, con una bolsa conteniendo el M/3I; lo destruido del material impide observar si este presenta huellas de corte. Lo que si se puede observar es que algunas de las piezas dentales presentan un marcado desgaste, aunque no es en todas, por ejemplo en el P3/Izquierdo. Individuo de 2 a 3 anos de edad.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Reconos 110+220, Resistol 850

Notas sobre consoli

Elementos: Craneo y mandibula

Notas Elementos:

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	**Izq.**	9.3	6	6.2	**Der.**	9.3	6	6.1
I2/	**Izq.**	10	5.5	7.3	**Der.**	9.8	5.9	7.4
I3/	**Izq.**	11	7.9	6.6	**Der.**	0	8	6.5
Cx/	**Izq.**	20.2	9	7.7	**Der.**	20.3	9	7.6
Pm1/	**Izq.**	6	5	6.8	**Der.**	6	5.1	7
Pm2/	**Izq.**	7.6	5.3	13.8	**Der.**	7.6	5.5	13.5

Canid

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

Pm3/	**Izq.**	7.3	6.1	14.7	**Der.**	7.5	6.2	14.1
Pm4/	**Izq.**			23.9	**Der.**	14.2	10.7	23.5
M1	**Izq.**	8.9	20.9	16.7	**Der.**	8.5	20.9	16.4
M2	**Izq.**	4.3	8.1	13.1	**Der.**	4.4	8	13.2

Dientes de leche? No Desgaste : Moderado

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	**Izq.**	0			**Der.**	6.2	4.9	3.6
I/2	**Izq.**	0			**Der.**	6.9	5.8	5
I/3	**Izq.**	10.6	7.4	7.2	**Der.**	10.4	7.7	7.2
C/x	**Izq.**	22.9	9.6	8	**Der.**	22.7	9.5	7.9
Pm/1	**Izq.**	5.2	4.4	6.1	**Der.**	5.3	4.5	6.1
Pm/2	**Izq.**	6.9	5.1	10.8	**Der.**	6.9	5.5	10.7
Pm/3	**Izq.**	7.9	5.9	13.3	**Der.**	0		
Pm4/	**Izq.**	9.9	7.5	14.9	**Der.**	10	7.6	14.9
M1	**Izq.**	14.6	11.1	26.7	**Der.**	14.4	11	26.8
M2	**Izq.**	7.1	8.6	11.7	**Der.**	7.1	8.5	11.8
M3	**Izq.**	4.1	5.7	5.8	**Der.**	4.2	5.6	5.7

Dientes de leche? No Desgaste Moderado

Notas

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	-998
				Nivel de fusion de cr	-998

Medidas Mandibula:

Izq. **Der.**

Canid

Longitud de mand	0	0
Longitud max:	0	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

No de Elemento:	577.1	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Juvenile/Adult
Asociacion:	Animal X	Familia:	Canidae	Sex:	-998

Notes: Dientes mucho mas chicos pero con morfologia de un lobo.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido, se pego p

Elementos: Craneo y mandibula

Notas Elementos: Craneo muy fragmentado aunque por la cantidad de fragmentos (como 9 fragmentos) nos indica que se trata de la denticion con muy pocos fragmentos del craneo.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	-998	-998	-998	Der.	0		
I3/	Izq.	-998	-998	-998	Der.	12.4	6.3	7.2
Cx/	Izq.	-998	-998	-998	Der.	0		
Pm1/	Izq.	0			Der.	6.3	4.8	7.3
Pm2/	Izq.	0			Der.	8.4	6.1	14.7
Pm3/	Izq.	0		0	Der.	0		
Pm4/	Izq.	0			Der.	0		

Canid

M1	Izq.	9.5	19.4	-15	Der.	9.7	18.5	14.9
M2	Izq.	0			Der.	3.7	8	11.5

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	7.5	3.7	-998	Der.	0		
I/2	Izq.	-998	-998	-998	Der.	7.8	4.9	6.2
I/3	Izq.	0			Der.	11	6.4	6.7
C/x	Izq.	0			Der.	0		
Pm/1	Izq.	0			Der.	0		
Pm/2	Izq.	0			Der.	6.9	5	11.3
Pm/3	Izq.	7	5.1	12	Der.	7.6	5	12.7
Pm4/	Izq.	-998	-998	-998	Der.	0		
M1	Izq.	13	-998	-998	Der.	0		
M2	Izq.	7	8.8	11.4	Der.	7.8	8.1	11.1
M3	Izq.				Der.	2.8	-998	-998

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cra		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0

Canid

Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

No de Elemento:	570	Capa:	LXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Young Adult
Asociacion:	Animal II	Familia:	Canidae	Sex:	Female

Notes: La fosa maseterica no es tan profundo ni tiene la linea marcada de esta region por la cual pensamos que se trata de una hembra. Todo su denticion es permanente pero no tiene desgaste en ellos, ademas se ve que su crano no esta fusionado, por lo tanto pensamos que se trata de un subadulto 10-12 meses de edad.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido superficie

Elementos: Craneo y mandibula

Notas Elementos: No se identifico fragmentos de neurocraneo. No se observo huellas de corte pero el superficie esta un poco sucio por la mezcla de tierra pegado al hueso por la consolidante que estaba aplicado desde antes, probablemente pegamento deluido en agua.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	10.5	6.1	6.1	Der.	10.2	6.1	6.4
I2/	Izq.	12.9	7.1	7.4	Der.	12.5	6.7	7.4
I3/	Izq.	0			Der.	15.1	7.3	8.5
Cx/	Izq.	26.2	-7.6	13.1	Der.	26.5	7.8	12.9
Pm1/	Izq.	6.5	4.6	7.2	Der.	6	4.9	7.2

Canid

Pm2/	**Izq.**	9.2	5.6	14.2	**Der.**	8.6	5.5	13.7
Pm3/	**Izq.**	9	6.6	14.5	**Der.**	8.2	6.2	14.8
Pm4/	**Izq.**	14.4	9.9	26.1	**Der.**	-998	-998	-998
M1	**Izq.**	10.5	20	15.2	**Der.**	10.3	17.6	14.9
M2	**Izq.**	-998	-998	-998	**Der.**	4.5	10.2	7

Dientes de leche? No   Desgaste : No

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	**Izq.**	7.7	4	5.3	**Der.**	7.3	3.9	5.1
I/2	**Izq.**	8.8	5.2	6.6	**Der.**	11.5	6.5	7
I/3	**Izq.**	11.6	6.4	6.7	**Der.**	0		
C/x	**Izq.**	23.3	7.4	12.9	**Der.**	24.6	8.1	12.1
Pm/1	**Izq.**	4.9	4.4	5.4	**Der.**	5.1	4.4	5.3
Pm/2	**Izq.**	8.2	5.2	12.2	**Der.**	8.1	5.3	11.6
Pm/3	**Izq.**	8.5	6	13.6	**Der.**	9.1	6.1	13.4
Pm4/	**Izq.**	11.4	7.6	15.3	**Der.**	11.3	7.9	15.3
M1	**Izq.**	17.4	10.5	27.2	**Der.**	16.9	10.8	28.6
M2	**Izq.**	7	7.6	10.3	**Der.**	7.2	7.6	11
M3	**Izq.**	3.1	5.4	6	**Der.**			

Dientes de leche? No   Desgaste No

Notas

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	-104.1	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

Canid

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0
Altura rama mand	61.3	0
Ancho rama mand	38.4	36.1
Altura rama mand M1	27.8	26.9

Canid

No de Elemento:	572	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Young Adult
Asociacion:	Animal V, NW	Familia:	Canidae	Sex:	Poss. F

Notes: Craneo solo se pudo reconstruir parte maxilar, premaxilar y nasales, probablemente fue preparado aunque no se identifico huellas de corte. Mandibula no se pudo encontrar fragmentos de proceso coracoide. Hay un poco de desgaste en los dientes, probablemente se trata de un adulto joven porque todavia se ve suturas craneales no fusionado. Tamano un poco mas chico, posiblemente hembra.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido. Se pego p

Elementos: Craneo y mandibula

Notas Elementos: Parte occipital ausente, en general solo parte frontal del craneo presente, posiblemente por ser preparado.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	-998	-998	-998	Der.	8.3	4.9	5.8
I2/	Izq.	10.5	6.6	6.8	Der.	10.5	6.4	-6.9
I3/	Izq.	12.8	7	8.5	Der.	-998	7.4	7.7
Cx/	Izq.	25.7	8.4	12.1	Der.	24	-998	11.7
Pm1/	Izq.	0			Der.	0		

Canid

Pm2/	Izq.	6.7	5.7	12.8	Der.	7.3	5.5	12.3
Pm3/	Izq.	7.8	6.2	14.4	Der.	7.9	5.2	12.6
Pm4/	Izq.	12.7	10	22.9	Der.	13.3	9.6	21.5
M1	Izq.	8.9	18	14.9	Der.	9.8	18	15.6
M2	Izq.	4.4	11.7	7.4	Der.	4.8	7.5	7.7

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	-998	-998	-998	Der.	10.5	-998	6.8
C/x	Izq.	24.6	8	12.7	Der.	-998	-998	-998
Pm/1	Izq.	4.6	4.4	5.9	Der.	4.8	4.7	5.7
Pm/2	Izq.	5.9	5	9.9	Der.	6.8	5.7	10.9
Pm/3	Izq.	7.6	6	13.2	Der.	7.5	6.8	13.2
Pm4/	Izq.	9.7	7.7	15.3	Der.	9.2	8.5	15.2
M1	Izq.	14.1	10.1	25.5	Der.	14.6	10	25.5
M2	Izq.	0			Der.	6.8	7.7	10
M3	Izq.				Der.	3.7	5	5.2

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cra	-998	Ancho del craneo:	-998	Ancho biorbital:	-998
Longitud basal:	-998	Ancho de los arcos z	-998	Ancho minimo front	-998
Largo del paladar:	-998	Ancho auricular:	-998	Longitud facial:	-998
Ancho maximo del p	75.2	Ancho frontal:	-998	Curva nasal:	-998
Longitud nasion-bas	-998	Ancho minimo inter	-998	Fuscion craneal:	3

Medidas Mandibula:

Nivel de fusion de cr -998

Canid

	Izq.	Der.
Longitud de mand	-998	-998
Longitud max:	-998	-998
Altura rama mand	-998	-998
Ancho rama mand	-998	-998
Altura rama mand M1	25.7	-27.9

Canid

No de Elemento:	2229	Capa:	LXXXI	Genus:	Canis
Entierro:	E.6	Class:	Mammalia	Specie:	lupus
Localidad:	T.12, E.6	Orden:	Carnivora	Age:	Juvenile
Asociacion:	N4-35	Familia:	Canidae	Sex:	-998

Notes: Craneo totalmente destruido, con una bolsa conteniendo el M/3I; lo destruido del material impide observar si este presenta huellas de corte. Lo que si se puede observar es que algunas de las piezas dentales presentan un marcado desgaste, aunque no es en todas, por ejemplo en el P3/Izquierdo. Individuo de 2 a 3 anos de edad. Identificacion al incio fue de un hibrido pero al analizar las medidas de Pm3 y Pm4 maxilar, se parece ser de un lobo. Dejamos la identificacion como posible lobo y es necesario ver con mas detalle este individuo.

Modificaciones del superficie

Mod Presente?	True	# de patologias:	
# de huellas:	2	Ubicacion de pat:	
Ubicacion:	Mandibula	# de mod	
		Ubicacion mod.	

Notas: En el cuerpo de la mandibula.

Consolidantes

Uso consolidante?: Si

Que tipo? Reconos 110+220, Resistol 850

Notas sobre consolic

Elementos: Craneo y mandibula

Notas Elementos: Diente decidua de canino mandibular izquierdo, altura 10.31, ancho 3.44, longitud A-P 5.12. Craneo muy fragmentado no se pudo reconstruir el craneo solo los dientes.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	8	5.3	4.9	Der.	8.1	5.3	4.5
I2/	Izq.	10.2	6	5.7	Der.	9.9	6.3	5.8
I3/	Izq.	11.8	6.3	8.3	Der.	12.9	5.4	7.4

Canid

Cx/	Izq.	23.4	-998	-998	Der.	20.4	-7.6	10.4
Pm1/	Izq.	5.5	5.1	6.3	Der.	5.9	4.4	6.5
Pm2/	Izq.	7.6	5.2	12.2	Der.	8.1	-998	11.9
Pm3/	Izq.	8.3	5.5	13.4	Der.	8.9	5.1	13.9
Pm4/	Izq.	14.3	9	20.3	Der.	12.4	8.6	21.6
M1	Izq.	9.2	18.3	13.6	Der.	10	18	14.2
M2	Izq.	4.5	10.5	7.2	Der.	5.1	10.2	6.6

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	7	3.5	4.1
I/2	Izq.	7.1	3.2	4.1	Der.	7	4.7	5.2
I/3	Izq.	7.3	4.5	4.6	Der.	9.3	5.8	5.9
C/x	Izq.	-998	-998	9.3	Der.	20.6	6.1	10.2
Pm/1	Izq.	4.9	4	5	Der.	4.7	3.9	5.2
Pm/2	Izq.	7.2	4.9	10.8	Der.	7.1	4.9	10.5
Pm/3	Izq.	8.1	4.5	12.6	Der.	7.6	4.9	11.7
Pm4/	Izq.	9.4	6.1	12.9	Der.	9.5	6.2	13.3
M1	Izq.	15.4	9.1	24.4	Der.	15.1	9.1	23.6
M2	Izq.	6.9	6.5	9.8	Der.	7.2	7.7	10.4
M3	Izq.				Der.			

Dientes de leche? Si Desgaste

Notas

Medidas Craneo:

Longitud maxima cra		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0

Canid

Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	-998
				Nivel de fusion de cr	-998

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

No de Elemento:	2243	Capa:	LXXXI	Genus:	Canis
Entierro:	E.6	Class:	Mammalia	Specie:	lupus
Localidad:	T.12, E.6	Orden:	Carnivora	Age:	Juvenile
Asociacion:	Esq. W	Familia:	Canidae	Sex:	-998

Notes: Craneo aplastado e incompleto. Las mandibulas tambien estan incompletas. El Ml3 de la mandibula derecha se tomo para muestra de analisis quimicos. Existen falanges y garras asociadas a este ejemplar. Incluye garras/falanges de canido y de un felino. La de felino unos se ve que no esta fusionado y se trata de un individuo chico.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Reconos 110+220, Resistol 850

Notas sobre consoli

Elementos: Craneo y mandibula

Notas Elementos:

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	-998	-998	-998	Der.	7.5	6.1	-4.2
I3/	Izq.	0			Der.	0		
Cx/	Izq.	-999	-999	-999	Der.	0		
Pm1/	Izq.	0			Der.	0		
Pm2/	Izq.	0			Der.	0		

Canid

Pm3/	Izq.	0		0	Der.	0		
Pm4/	Izq.	0			Der.	0		
M1	Izq.	0			Der.	0		
M2	Izq.	0			Der.	0		

Dientes de leche? Si Desgaste :

Notas: Solo incisivos permanentes

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	0			Der.	0		
Pm/1	Izq.				Der.	4.7	3.6	5.5
Pm/2	Izq.	0			Der.	0		
Pm/3	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0		
M1	Izq.	0			Der.	0		
M2	Izq.	0			Der.	0		
M3	Izq.				Der.			

Dientes de leche? Si Desgaste

Notas Solo Pm1 permanente.

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	3
				Nivel de fusion de cr	-998

Medidas Mandibula:

Izq. Der.

Canid

Longitud de mand	0	0
Longitud max:	0	0
Altura rama mand	24.1	0
Ancho rama mand	28.6	0
Altura rama mand M1	20.6	23

Canid

No de Elemento:	576.1	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Adult
Asociacion:	Animal IX, SW	Familia:	Canidae	Sex:	-998

Notes: Todo la denticion es permanente, y el canino inferior derecho tiene muchisimo desgaste, mas que se ven en los premolares, asi que probablemente fue un adulto viejo o sus canios fueron desgastados por otra razon. El estado del craneo fue muy deteriorado, por lo tanto no se sabe si el craneo fue fusionado. Tiene consolidante antes de analizar probablemente de resitol deluido.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido, se pego p

Elementos: Craneo y mandibula

Notas Elementos: Muy fragmentado, pero los fragmentos identificados son maxilares, no existe parte de cigomatico ni nuerocraneo.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	11.5	-998	7.4	Der.	12	6	7.2
Pm1/	Izq.	0			Der.	-998	-998	-998

Canid

Pm2/	**Izq.**	6.9	-998	12.1	**Der.**	6.7	-998	11.6
Pm3/	**Izq.**	6.4	998	13	**Der.**	6.7	4.6	12.9
Pm4/	**Izq.**	11.2	7.5	-998	**Der.**	-998	-998	-998
M1	**Izq.**	-998	-998	-998	**Der.**	7.4	16.9	12.1
M2	**Izq.**	0			**Der.**	3.8	11.4	7.2

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	**Izq.**	0			**Der.**	-998	-998	-998
I/2	**Izq.**	0			**Der.**	7.3	-998	-998
I/3	**Izq.**	0			**Der.**	-998	-998	-998
C/x	**Izq.**	-998	6.9	9.6	**Der.**	16.6	7.8	11.4
Pm/1	**Izq.**	5.4	-998	-998	**Der.**	5.2	-998	3.6
Pm/2	**Izq.**	6.2	4.8	11.9	**Der.**	-998	-998	-998
Pm/3	**Izq.**	6.4	4.8	11.8	**Der.**	5.9	5.1	11.4
Pm4/	**Izq.**	7.1	5.5	12.5	**Der.**	7.8	5.9	12.6
M1	**Izq.**	-11.6	-998	21.3	**Der.**	12.2	9.1	21.4
M2	**Izq.**	5.5	-6.4	-10.2	**Der.**	6	7.6	10.6
M3	**Izq.**	2.3	4.6	4.9	**Der.**	2.4	4.2	5.1

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

Canid

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

No de Elemento:	1959	Capa:	LXXXI	Genus:	Canis
Entierro:	E.6	Class:	Mammalia	Specie:	latrans
Localidad:	T.12, E.6	Orden:	Carnivora	Age:	Juvenile
Asociacion:	N2-31	Familia:	Canidae	Sex:	Female

Notes: Individuo de 4-7 meses de edad. El elemento 1959 corresponde al craneo. Se embalo conjuntamente con felino. Craneo totalmente destruido, se pudieron identificar fragmentos nasales, basi-occipital derecho y maxilar del mismo lado. Dentarios en un 40-50% ambos fracturados en la cara anterior lingual la cual hace falta. Se pudieron identificar como elementos asociados falanges con garras. No hay evidencia de huellas de corte.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Reconos 110+220, Resistol 850

Notas sobre consoli

Elementos: Cran, mand y garras

Notas Elementos:

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	6.9	4.6	4.4	Der.	0		
I2/	Izq.	8.4	4.9	5.5	Der.	8.2	5	5.5
I3/	Izq.	10.9	5.8	6.6	Der.	11	5.8	6.3
Cx/	Izq.	-999	-999	-999	Der.	18.4	5.9	7.7
Pm1/	Izq.	5	3.9	6.2	Der.	0		
Pm2/	Izq.	6.3	4.1	11.3	Der.	0		

Canid

Pm3/	Izq.	6.5	4.4	13.4	Der.	6.7	4.4	13.3
Pm4/	Izq.	10.3	7.3	19.2	Der.	10.9	7.2	19.3
M1	Izq.	7.3	17.2	12.6	Der.	7.2	17.1	12.5
M2	Izq.	4.1	12.2	7.9	Der.	4	12.2	7.8

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	4.4	3.4	2.5	Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	7.9	5	5.1	Der.	0		
C/x	Izq.	22.1	7.2	9.9	Der.	22.3	7.6	9.4
Pm/1	Izq.	0			Der.	3.8	2.9	5
Pm/2	Izq.	6.2	4.2	11.3	Der.	6.2	4.2	11.2
Pm/3	Izq.	6.2	4.9	11.2	Der.	6.3	4.2	11.2
Pm4/	Izq.	7.7	5.4	13.1	Der.	7.5	5.4	13.2
M1	Izq.	12.4	7.9	21.6	Der.	12.6	7.8	21.6
M2	Izq.	4.6	6.5	9.3	Der.	4.5	6.4	9.4
M3	Izq.				Der.			

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cra		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	3
				Nivel de fusion de cr	6

Medidas Mandibula:

Izq. Der.

Canid

Longitud de mand	0	0
Longitud max:	0	0
Altura rama mand	44.8	0
Ancho rama mand	29.6	29.7
Altura rama mand M1	0	17.2

Canid

No de Elemento:	2072	Capa:	LXXXI	Genus:	Canis
Entierro:	E.6	Class:	Mammalia	Specie:	lupus
Localidad:	T.12, E.6	Orden:	Carnivora	Age:	Juvenile
Asociacion:	N5-33	Familia:	Canidae	Sex:	-998

Notes: ± 4 mesesde edad,Canis lupus o Canis lupus-familiaris (Hibrido)Craneo aplastado, que presenta huellas de corte en el parietal izquierdo. Presenta incisivos fuera, caninos permanentes en proceso de erupcion. Presenta los siguientes dientes de leche: ML2, ML1-3 izquierdos y ML1-2 derechos. Inicialmente identificado como posible lobo o hibrido. Al ver las medidas de Pm3 y Pm4 se ve que se trata de un lobo.

Modificaciones del superficie

Mod Presente?	True	# de patologias:	
# de huellas:	11	Ubicacion de pat:	
Ubicacion:	Craneo y mandi	# de mod	1
		Ubicacion mod.	Corte en el nuerocrane

Notas: Huellas en la parietal, maxilar y en el cuerpo de la mandibula. Sobre la cresta nucal esta cortado para extraer el cerebro.

Consolidantes

Uso consolidante?: Si

Que tipo? Reconos 110+220, Resistol 850

Notas sobre consoli

Elementos: Craneo y mandibula

Notas Elementos: Ausencia pareital base del craneo excepto en alveolo derechas.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	9.2	5.4	5.2	Der.	9.1	5.5	5.1
I2/	Izq.	10.2	5.5	7.4	Der.	10.2	5.6	7.3
I3/	Izq.	13	4.9		Der.	12.9	5	8.4
Cx/	Izq.	22.1	6.6	11.2	Der.	0		
Pm1/	Izq.	0			Der.	6	4.6	6.6

Canid

Pm2/	**Izq.**	0			**Der.**	7.3	5	12.9
Pm3/	**Izq.**	6.9	6	12.3	**Der.**	0		
Pm4/	**Izq.**	13.8	9	26.5	**Der.**	13.6	9.1	26
M1	**Izq.**	10.6	20	14.8	**Der.**	10.6	20.1	14.7
M2	**Izq.**	5.4	10.8	7.6	**Der.**	5.7	10	7.4

Dientes de leche? Si Desgaste :

Notas: ML2 en erupcion

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	**Izq.**	5.6	4.5	3.7	**Der.**	6.1	4.6	3.7
I/2	**Izq.**	7.5	4.5	5	**Der.**	7.5	4.9	4.8
I/3	**Izq.**	9.8	5.4	7	**Der.**	9.4	5.3	7.1
C/x	**Izq.**	0			**Der.**	0		
Pm/1	**Izq.**	4.8	4.2	6	**Der.**	4.6	4.1	6.2
Pm/2	**Izq.**	0			**Der.**	0		
Pm/3	**Izq.**	0			**Der.**	0		
Pm4/	**Izq.**	0			**Der.**	0		
M1	**Izq.**	15.9	9.6	26	**Der.**	15.6	10.03	26
M2	**Izq.**	8	9	13.1	**Der.**	8	8.6	6.5
M3	**Izq.**				**Der.**			

Dientes de leche? Si Desgaste

Notas ML1, ML2, y ML3 en erupcion

Medidas Craneo:

Longitud maxima cr	197.6	Ancho del craneo:	82.1	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	97
Ancho maximo del p	78.2	Ancho frontal:	35.5	Curva nasal:	0
Longitud nasion-bas	90.6	Ancho minimo inter	0	Fuscion craneal:	3
				Nivel de fusion de cr	7

Medidas Mandibula:

Canid

	Izq.	Der.
Longitud de mand	145	0
Longitud max:	143	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	24	0

Canid

No de Elemento:	2079	Capa:	LXXXI	Genus:	Canis
Entierro:	E.6	Class:	Mammalia	Specie:	lupus
Localidad:	T.12, E.6	Orden:	Carnivora	Age:	Young Adult
Asociacion:		Familia:	Canidae	Sex:	Poss. F

Notes: 5 a 6 meses de edad, posible hembra. Craneo parcialmente destruido, con algunos elementos del craneo que pueden ser pegados. Presenta huellas de corte en dentario izquierdo a la altura vestibular de M1 y muy posiblemente en maxilar izquierdo. La fractura del neurocraneo parece ser hecha intencionalmente. Con garras y falanges, algunos epifisis no fusionado de metapodiales. Al inicio se identifico como posible hibrido o lobo. Las medidas de Pm3 y Pm4 suguiere que se trata de un lobo.

Modificaciones del superficie

Mod Presente?	True	# de patologias:	
# de huellas:	5	Ubicacion de pat:	
Ubicacion:	Craneo y mandi	# de mod	
		Ubicacion mod.	

Notas: Presenta huellas de corte en dentario izquierdo a la altura vestibular de M1 y muy posiblemente en maxilar izquierdo.

Consolidantes

Uso consolidante?: Si

Que tipo? Reconos 110+220, Resistol 850

Notas sobre consoli

Elementos: Cran, mand y garras

Notas Elementos:

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	9.8	5.8	6.1	Der.	9.8	5.8	6.2
I2/	Izq.	10.6	6.5	6.9	Der.	10.5	6.5	7
I3/	Izq.	13	6.7	7.1	Der.	13.2	6.2	7.2
Cx/	Izq.	22.1	8.2	6.4	Der.	21.9	8.4	6.5
Pm1/	Izq.	6	4.9	6.7	Der.	6	4.9	6.5

Canid

Pm2/	Izq.	7.2	4.7	12	Der.	7.4	4.4	11.9
Pm3/	Izq.	8.4	5.9	14.2	Der.	8.8	5.3	14
Pm4/	Izq.	13.8	9.1	22.2	Der.	13.9	9.2	22.5
M1	Izq.	9	19.4	14.3	Der.	8.4	19.1	14.1
M2	Izq.	4.1	11.4	7.2	Der.	4.2	11.4	7.2

Dientes de leche? No   Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	7.4	4.7	3.7	Der.	7.4	4.5	3.6
I/2	Izq.	8.1	5.2	5.4	Der.	8.1	5.2	5.3
I/3	Izq.	10.1	6.3	6.6	Der.	10	6.2	6.6
C/x	Izq.	19.6	7.8	9.3	Der.	19.6	8.7	10.3
Pm/1	Izq.	4.9	4.4	5.5	Der.	5	4.4	5.4
Pm/2	Izq.	7.2	4.5	10.5	Der.	7	4.7	10.7
Pm/3	Izq.	8	5.4	12.4	Der.	7.9	5.7	12.2
Pm4/	Izq.	9.4	6	13.5	Der.	9.4	6.1	13.2
M1	Izq.	0			Der.	14.4	9.1	23.4
M2	Izq.	7.9	7.6	10.7	Der.	7.9	7.8	11
M3	Izq.	3.8	5	5.8	Der.	3.8	5.1	5.6

Dientes de leche? No   Desgaste

Notas

Medidas Craneo:

Longitud maxima cra		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	44.4
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	52.6	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	38.1	Fuscion craneal:	3
				Nivel de fusion de cr	5

Medidas Mandibula:

Canid

No de Elemento:	2194	Capa:	LXXXI	Genus:	Canis
Entierro:	E.6	Class:	Mammalia	Specie:	lupus
Localidad:	T.12, E.6	Orden:	Carnivora	Age:	Adult
Asociacion:	N5-R35	Familia:	Canidae	Sex:	Female

Notes: Entre 1-2 anos de edad. Las piezas dentales presentan un desgaste moderado, que permiten establecer que la edad es de entre uno y dos anos.

Modificaciones del superficie

Mod Presente?	True	# de patologias:	
# de huellas:	25	Ubicacion de pat:	
Ubicacion:	Craneo y mandi	# de mod	1
		Ubicacion mod.	corte transversal

Notas: Huellas en los parietales cerca de la cresta sagital, arco cigomatico, y sobre la mandibula. Un corte transversal sobre la cresta nucal. Hay huellas en un falange en la diafisis tambien.

Consolidantes

Uso consolidante?: Si

Que tipo? Reconos 110+220, Resistol 850

Notas sobre consoli

Elementos: Cran, mand y garras

Notas Elementos:

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	**Izq.**	10.1	6.1	6.2	**Der.**	9	5.1	6.4
I2/	**Izq.**	0			**Der.**	10.2	7	7.8
I3/	**Izq.**	0			**Der.**	13.5	5.6	8.2
Cx/	**Izq.**	19.1	8.7	12	**Der.**	22.1	8.6	12.5
Pm1/	**Izq.**	7.7		8.8	**Der.**	7.2	5	7.7
Pm2/	**Izq.**	8.5	6	14.1	**Der.**	6.1	6.3	13.3
Pm3/	**Izq.**	7.9	6.6	16.5	**Der.**	7.9	6.3	14.9

Canid

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

Pm4/	**Izq.**	14.5	13.4	24.5	**Der.**	13.9	13.3	23.6
M1	**Izq.**	9.9	21.4	17	**Der.**	8.7	18.1	15.1
M2	**Izq.**	5.5	12.4	8.3	**Der.**	4.3	12	7.9

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	**Izq.**	5.1	4.9	3.8	**Der.**	8.4	4.8	3.9
I/2	**Izq.**	6.4	6.9	4.6	**Der.**	8.9	6.7	5.4
I/3	**Izq.**	6.4	8.1	8.3	**Der.**	0		
C/x	**Izq.**	23.8	8.4	10.2	**Der.**	24.3	9.1	13.7
Pm/1	**Izq.**	5.7	4.9	6.1	**Der.**	5	5	5.8
Pm/2	**Izq.**	7	5.8	12.2	**Der.**	7.9	6.7	12
Pm/3	**Izq.**	7.7	6.4	12.7	**Der.**	8	6.1	12.6
Pm4/	**Izq.**	10.2	7.5	1.2	**Der.**	8.7	8	14.7
M1	**Izq.**	14.2	12	26.9	**Der.**	14.2	17.5	26.2
M2	**Izq.**	7.2	8.4	11.9	**Der.**	5.4	9.2	11.9
M3	**Izq.**	5.9	5.7	5.8	**Der.**			

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	62.2	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	42.8
Largo del paladar:	114.1	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	14.6	Ancho frontal:	59.3	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	3
				Nivel de fusion de cr	7

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	172.71	171.3

Canid

Longitud max:	180.2	180
Altura rama mand	69.9	68.1
Ancho rama mand	30.8	30.9
Altura rama mand M1	30.6	29.3

Canid

No de Elemento:	2244	Capa:	LXXXI	Genus:	Canis
Entierro:	E.6	Class:	Mammalia	Specie:	lupus
Localidad:	T.12, E.6	Orden:	Carnivora	Age:	Juvenile
Asociacion:	N1-35	Familia:	Canidae	Sex:	-998

Notes: La mayoria del craneo esta fragmentado y muy pocos segmentos se pudieron completar. Los huesos que no aparecieron son los que forman parte del occipital. Todavia mantiene los dientes deciduales. Los dientes permanentes que estaban en erupcion 3pm y 2m inferiores y superiores. Se tomo el molar permanente 2 superior derecho para muestra de analisis quimicas. Existen falanges y garras asociadas a este ejemplar.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Reconos 110+220, Resistol 850

Notas sobre consoli | Elementos: Cran, mand y garras

Notas Elementos: Garras con falanges tambien asociado al craneo. Los falanges no estan fusionados.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	10.6	6.2	7	Der.	8.1	6.2	6.1
I2/	Izq.	12.2	7.1	6.5	Der.	9.7	7	6.8
I3/	Izq.	-13.3	-6	-9	Der.	13	6.1	9.3
Cx/	Izq.	-998	-6.4	-998	Der.	-998	-998	-998
Pm1/	Izq.	0			Der.	6.5	5.4	7.3

Canid

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
Pm2/	Izq.	7.4	-3.6	-10.5	Der.	-998	-6.1	-11.7
Pm3/	Izq.	7.8	5.8	-12.3	Der.	8.6	6.9	13.3
Pm4/	Izq.	16	13.4	-25.1	Der.	14.7	13.2	-25.3
M1	Izq.	11.3	18.2	16.3	Der.	11.3	19.1	15.9
M2	Izq.	-4.6	12.7	8.8	Der.	7	11.7	8.6

Dientes de leche? Si | Desgaste :

Notas: Pm3 y 2m inferiores y superiores en erupcion

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	7.3	3.8	5.2	Der.	8.4	3.5	5.2
I/2	Izq.	8.1	5.3	6.4	Der.	8.6	5.7	6.4
I/3	Izq.	12.1	7.2	7.5	Der.	12	7.3	7.2
C/x	Izq.	-998	-9	-998	Der.	-22.7	-11.1	-998
Pm/1	Izq.	4.6	4.6	6	Der.	5.8	4.9	5.9
Pm/2	Izq.	8.4	5.4	-11.4	Der.	8.2	5.8	12.3
Pm/3	Izq.	-8.1	6.2	-13.2	Der.	8.2	6.7	13.4
Pm4/	Izq.	-10.2	-6.9	15.4	Der.	10.7	-998	-14.8
M1	Izq.	17	10	27.2	Der.	18.8	10.8	26.8
M2	Izq.	-7.3	7.6	11.4	Der.	0		
M3	Izq.				Der.			

Dientes de leche? Si | Desgaste

Notas: Pm3 y 2m inferiores y superiores en erupcion

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	3
				Nivel de fusion de cr	-998

Medidas Mandibula:

Canid

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	-27.8	29.8

Canid

No de Elemento:	579.2	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	sp.
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Adult
Asociacion:	Animal XII, NE	Familia:	Canidae	Sex:	-998

Notes: Asociado a animal XII. Solo representado por un incisivo 3 superior izquierda mezclado con los materiales de un craneo de lobo Ele 579.1.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: -998

Que tipo?

Notas sobre consolic

Elementos: Teeth

Notas Elementos:

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	15.1	6.3	8.8	Der.	0		
Cx/	Izq.	-999	-999	-999	Der.	0		
Pm1/	Izq.	0			Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0		0	Der.	0		
Pm4/	Izq.	0			Der.	0		

Canid

M1	Izq.	0			Der.	0		
M2	Izq.	0			Der.	0		

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	0			Der.	0		
Pm/1	Izq.	0			Der.	0		
Pm/2	Izq.	0			Der.	0		
Pm/3	Izq.	0			Der.	0		
Pm4/	Izq.	0			Der.	0		
M1	Izq.	0			Der.	0		
M2	Izq.	0			Der.	0		
M3	Izq.				Der.			

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0

Canid

Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

No de Elemento:	580	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Adult
Asociacion:	Animal XIII, SW	Familia:	Canidae	Sex:	-998

Notes: Estado muy deteriorado, solo se pudo recuperar las piezas dentales. Parece que fue consolidado con un pegamento en bloque, un consolidante que se resolve facilmente con la aplicacion de acetona. Hay una bolsa con materail no consolidado pero no trae material dentario. Todos los dientes son permanentes, por lo tanto suponemos que es un juvenile u adulto. Hay un pco de desgaste en los dientes carnasiales por lo tanto puede ser adulto.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido, se pego p

Elementos: Craneo y mandibula

Notas Elementos: Completamente fragmentado. Se nota la presencia de mandibula y fragmentos de hueso nasal, frontal, pero no se distingue otros huesos como la parte nuero craneo.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	9	5.8	6.5	Der.	8.9	6.1	6.1
I2/	Izq.	0			Der.	10.3	6.5	6.3
I3/	Izq.	0			Der.	14	7.2	8.2
Cx/	Izq.	-998	-998	-998	Der.	0		
Pm1/	Izq.	6.4	5.1	7.4	Der.	6.1	5	6.9

Canid

Pm2/	Izq.	6.2	4.9	12.4	Der.	7.4	5.1	11.9
Pm3/	Izq.	7	5.6	12.4	Der.	8.3	5.9	12.3
Pm4/	Izq.	-998	-998	-998	Der.	14.9	9.8	23.1
M1	Izq.	9.9	-18	-14.9	Der.	10.7	20.3	14.5
M2	Izq.	0			Der.	5.1	11.9	7.7

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	6.2	3.9	4.9	Der.	6.4	3.6	4.1
I/2	Izq.	7.2	5	4.1	Der.	7.5	4.9	4.3
I/3	Izq.	9.5	6.4	5.2	Der.	9.7	6.2	4.6
C/x	Izq.	23.6	7.9	13	Der.	25.9	7.2	11.9
Pm/1	Izq.	0			Der.	4.9	4.6	5.3
Pm/2	Izq.	7.6	5.3	11.3	Der.	7.6	5.4	11
Pm/3	Izq.	8.4	6.1	14.2	Der.	7.9	6.1	13.7
Pm4/	Izq.	10.3	6.8	14.3	Der.	9.6	-998	-14.1
M1	Izq.	0			Der.	15.4	-998	-998
M2	Izq.	7.3	8.1	11.7	Der.	8.1	8.5	11.8
M3	Izq.	3.7	5.4	5.6	Der.	3.7	5.1	5.7

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cra	-998	Ancho del craneo:	-998	Ancho biorbital:	-998
Longitud basal:	-998	Ancho de los arcos z	-998	Ancho minimo front	-998
Largo del paladar:	-998	Ancho auricular:	-998	Longitud facial:	-998
Ancho maximo del p	-998	Ancho frontal:	-998	Curva nasal:	-998
Longitud nasion-bas	-998	Ancho minimo inter	-998	Fuscion craneal:	-998

Medidas Mandibula:

Nivel de fusion de cı	-998

Canid

No de Elemento:	597.1	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Juvenile/Adult
Asociacion:	SE, W de ele 57	Familia:	Canidae	Sex:	-998

Notes: 3 individuos mezclado en esta elemento Ele 597.1 y 597.2 son de lobos representado por unos fragmentos craneales y su denticion. Ele 597.3 esta representado por unos fragmentos de mandibula y dientes de un felino. Todos dientes permanentes pero sin indicacion de mucho desgaste.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido, se pego p

Elementos: Craneo y mandibula

Notas Elementos: Craneo en muy mal estado de conservacion, no se pudo identificar todos los fragmentos pero son fragmentos maxilares por su mayoria. La mandibula tambien esta en mal estado de conservacion, solo se pudo verificar la presencia de huesos de la mandibula y la ubicaccion de unos fragmentos.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	10	5.8	6	Der.	9.7	5.7	6
I2/	Izq.	10	7.1	6.7	Der.	10.4	6.8	-998
I3/	Izq.	13.5	-998	7	Der.	14	6.7	8.3
Cx/	Izq.	23	8.8	10.9	Der.	-998	-998	-998
Pm1/	Izq.	6.9	5.8	7	Der.	6.7	5.4	7.2

Canid

	Izq.	Der.
Longitud de mand	-998	-998
Longitud max:	-998	-998
Altura rama mand	-998	-998
Ancho rama mand	-998	-998
Altura rama mand M1	-998	-998

Canid

Pm2/	**Izq.**	8.1	5.6	13.4	**Der.**	8	5.9	13.5
Pm3/	**Izq.**	7.7	6.2	14.8	**Der.**	8	6.1	14.9
Pm4/	**Izq.**	14.6	9.6	23.6	**Der.**	14	9.5	23.5
M1	**Izq.**	10.7	17.6	14.9	**Der.**	10.3	17.7	15.7
M2	**Izq.**	3.7	11	7.8	**Der.**	4.3	11	8

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	**Izq.**	6.6	3.8	5.1	**Der.**	7.3	3.8	5.2
I/2	**Izq.**	-998	4.9	-998	**Der.**	-998	4.9	-998
I/3	**Izq.**	11	6.3	5.4	**Der.**	11.4	5.8	6.4
C/x	**Izq.**	24	-998	-12.2	**Der.**	-998	-8.5	-998
Pm/1	**Izq.**	5.4	4.9	5.9	**Der.**	5.5	4.9	5.9
Pm/2	**Izq.**	7.5	5.3	10.9	**Der.**	6.5	5.8	10.7
Pm/3	**Izq.**	8.2	6	13.6	**Der.**	7.9	5.7	13.5
Pm4/	**Izq.**	10.5	7.3	15.4	**Der.**	9.9	7.2	15
M1	**Izq.**	15.2	9.9	26.7	**Der.**	9.9	7.5	14.9
M2	**Izq.**	7	8.3	11.6	**Der.**	15.6	9.8	26.9
M3	**Izq.**	4.9	5.4	6.4	**Der.**			

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

Canid

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

No de Elemento:	597.2	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Adult
Asociacion:	SE, W de ele 57	Familia:	Canidae	Sex:	-998

Notes: Segundo lobo de este elemento. Tambien son de un lobo con dientes permanentes. Estos dientes tiene un poco mas desgaste que 597.1.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido, se pego p   Elementos: Craneo y mandibula

Notas Elementos: Solo fragmentos dentuarios presentes.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	11.4	6.6	6.9	Der.	11.8	6.9	6.7
I3/	Izq.	-998	-998	-998	Der.	12.7	6.2	7.6
Cx/	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm1/	Izq.	6.3	5.5	7.4	Der.	6.5	5.5	7.4
Pm2/	Izq.	7.8	-998	13.2	Der.	8.8	5.5	13.1
Pm3/	Izq.	8.3	6.3	15.5	Der.	8.2	6.2	15.5
Pm4/	Izq.	-998	-998	-998	Der.	13.1	9.8	22.7

Canid

M1	Izq.	9	17.3	14.2	Der.	10.1	17.5	14.8
M2	Izq.	3.2	10.3	-998	Der.	4.5	11.5	8

Dientes de leche? No   Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	-998	3.4	-998
I/2	Izq.	0			Der.	8.4	5.1	5.7
I/3	Izq.	0			Der.	0		
C/x	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm/1	Izq.	4.7	4.4	5.7	Der.	0		
Pm/2	Izq.	7.5	5.3	11.1	Der.	0		
Pm/3	Izq.	8.1	5.8	13.1	Der.	0		
Pm4/	Izq.	10.2	7.2	15	Der.	-998	-998	-998
M1	Izq.	15.2	9.8	26	Der.	15.1	9.3	26.4
M2	Izq.	6.8	8.3	10.6	Der.	0		
M3	Izq.				Der.			

Dientes de leche? No   Desgaste

Notas

Medidas Craneo:

Longitud maxima cra		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0

Canid

Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

No de Elemento:	601.1	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Adult
Asociacion:	Animal XV, NE	Familia:	Canidae	Sex:	-998

Notes: Posible adulto. Material muy fragmentado pero por la distribucion de dentarios parece que esta mezclado otro canido por la duplicacion de tres dientes mandibulares. Por la presencia de solo dientes permanentes y la presencia de desgaste en los dientes suguiere que es un individuo adulto.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: No

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido, se pego p

Elementos: Craneo y mandibula

Notas Elementos: Craneo muy fragmentado pero los fragmentos identificado son de la parte frontal con ningun fragmento neurocraneo identificado.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	9.4	5.3	-998	Der.	-998	6	-998
I2/	Izq.	11.9	6.5	7.7	Der.	10.6	6.5	7.8
I3/	Izq.	14.6	7.5	8.4	Der.	13.7	7	9
Cx/	Izq.	-998	-998	-998	Der.	23.7	7.4	12.2
Pm1/	Izq.	0			Der.	6.3	5.2	7.3
Pm2/	Izq.	7.6	5.4	11.6	Der.	7.7	5.5	11.3
Pm3/	Izq.	7.8	5.7	13.3	Der.	8.1	5.9	13.4

Canid

Pm4/	Izq.	-998	-998	-998	Der.	13	9.6	21.9
M1	Izq.	9.2	19.4	13.2	Der.	9.7	19.6	12.9
M2	Izq.	4.9	12.1	7.9	Der.	3.9	12.1	8.6

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	0			Der.	-998	7.7	11.8
Pm/1	Izq.	4.2	4.3	5.7	Der.	5.1	5.1	6
Pm/2	Izq.	6.9	5.2	12.1	Der.	0		
Pm/3	Izq.	7.6	6.5	15.6	Der.	7.5	7.4	15.8
Pm4/	Izq.	9.4	7.1	15	Der.	9.4	7.1	15
M1	Izq.	13.1	10.2	26.4	Der.	13.9	10.1	-998
M2	Izq.	5.3	8.8	11.7	Der.	0		
M3	Izq.	3.7	5.7	5.9	Der.	4.4	5.9	6.2

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	0	0

Canid

Longitud max:	0	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

No de Elemento:	601.2	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	sp.
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Juvenile/Adult
Asociacion:	Animal XV, NE	Familia:	Canidae	Sex:	-998

Notes: Tres dientes muzclado con ele 601.1, pero se soplan. Puede ser de otro individuo cercano. Los tres son dientes permanentes bien formado por lo tanto debe ser un individuo mas que un ano de edad.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido, se pego p

Elementos: Teeth

Notas Elementos:

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	0			Der.	0		
Cx/	Izq.	-999	-999	-999	Der.	0		
Pm1/	Izq.	0			Der.	0		
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0		0	Der.	0		
Pm4/	Izq.	0			Der.	0		

Canid

M1	Izq.	0			Der.	0		
M2	Izq.	0			Der.	0		

Dientes de leche? Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	0			Der.	0		
C/x	Izq.	0			Der.	0		
Pm/1	Izq.	0			Der.	0		
Pm/2	Izq.	0			Der.	0		
Pm/3	Izq.	7	5.7	13.6	Der.	6.3	5.7	13.83
Pm4/	Izq.	0			Der.	0		
M1	Izq.	0			Der.	0		
M2	Izq.	0			Der.	0		
M3	Izq.	2.3	4.5	-998	Der.			

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0

Canid

No de Elemento:	606	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Adult
Asociacion:	Animal XVI, NE	Familia:	Canidae	Sex:	Male

Notes: Craneo fragmentado y mandibula bien conservado. Dientes permanentes desgastado por lo tanto se trata de un adulto. Por la mandibula robusto y profundidad de la fosa muscular, probablemente se trata de un individuo macho.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido, se pego p

Elementos: Craneo y mandibula

Notas Elementos: Craneo fragmentado pero se localizo varias fragmentos que se pudo identificar. Es interesante que hay fragmentos basales mientras no se observo fragmentos de neurocraneo. Mandibula casi completo.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	**Izq.**	0			**Der.**	0		
I2/	**Izq.**	0			**Der.**	0		
I3/	**Izq.**	0			**Der.**	0		
Cx/	**Izq.**	-998	-998	-998	**Der.**	-998	-998	-998
Pm1/	**Izq.**	6.4	5	7.3	**Der.**	-998	5	7.7
Pm2/	**Izq.**	8.1	6	13.3	**Der.**	8	5.9	13.6

Canid

Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

Pm3/	**Izq.**	8.4	6.4	15.5	**Der.**	8.5	6.9	15.5
Pm4/	**Izq.**	14.5	10.1	25.6	**Der.**	14.7	10.1	26
M1	**Izq.**	0			**Der.**	9.9	20	17.4
M2	**Izq.**	3.9	13.1	8.6	**Der.**	4.3	12.6	8.4

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	**Izq.**	7	3.5	5.1	**Der.**	7.7	3.4	5.2
I/2	**Izq.**	7.8		6.7	**Der.**	8.2	5	6.3
I/3	**Izq.**	11.7	6.3	6.8	**Der.**	10.6	6.5	7
C/x	**Izq.**	25.5	7.8	11.7	**Der.**	-24.2	8.7	13.2
Pm/1	**Izq.**	4.6	4.9	5.9	**Der.**	6.6	5.8	7.5
Pm/2	**Izq.**	0			**Der.**	0		
Pm/3	**Izq.**	8.9	6.2	13.5	**Der.**	9	6.4	14.2
Pm4/	**Izq.**	10.3	7.7	15.5	**Der.**	10.4	8.4	16.2
M1	**Izq.**	16.7	11.2	27.7	**Der.**	15.8	10.8	27
M2	**Izq.**	6.6	8.5	11.8	**Der.**	6.5	9.1	12.1
M3	**Izq.**	4	6	5.5	**Der.**			

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cr	-998	Ancho del craneo:	-998	Ancho biorbital:	-998
Longitud basal:	-998	Ancho de los arcos z	-998	Ancho minimo front	-998
Largo del paladar:	-998	Ancho auricular:	-998	Longitud facial:	-998
Ancho maximo del p	-998	Ancho frontal:	-998	Curva nasal:	-998
Longitud nasion-bas	-998	Ancho minimo inter	-998	Fuscion craneal:	-998
				Nivel de fusion de cr	-998

Medidas Mandibula:

Izq. **Der.**

Canid

	Izq.	**Der.**
Longitud de mand	168.8	-167.9
Longitud max:	169.2	170.6
Altura rama mand	70.9	69.3
Ancho rama mand	40.3	40.3
Altura rama mand M1	27.1	27.6

Canid

No de Elemento:	642	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Juvenile
Asociacion:	Animal XIX, NW	Familia:	Canidae	Sex:	-998

Notes: Tiene una mezcla de huesos deciduos y permanentes. Las suturas, por ejemplo de los huesos maxilares, lacrimal, no son fusionados. Hubo material mezclado de este individuo en la bolsa de Ele 632, y tambien hubo un incisivo 3 superior de felino, probablemente de Ele 632 y Ele 571 mezclado en estas bolsas. Se pudo medir varias dientes aunque hubieran estado al dentro del encia porque la mandibula y maxila estaban fragmentados. Por la presencia de incisivo deciduas, los premolares deciduos 2, 3 y 4 con los permanentes fromando en la encia, pensamos que se trata de un individuo 3-4 meses de edad.

Modificaciones del superficie

Mod Presente?	True	# de patologias:	
# de huellas:	10	Ubicacion de pat:	
Ubicacion:	Maxila y mandi	# de mod	
		Ubicacion mod.	

Notas: Unas huellas de corte en maxilar derecha y en mandibula izquierda y derecha.

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido, se pego p

Elementos: Craneo y mandibula

Notas Elementos: Se presento unas huellas de corte despues del limpieza del superficie. Muy fragmentado pero se ve solo piezas maxilares, premaxilares y paladales. Probablemente no tuvo parte nuerocraneo.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	9.4	5.5	5.9	Der.	9.8	5.4	5.4
I2/	Izq.	11.3	6.6	6.8	Der.	11.7	7.1	6.9
I3/	Izq.	13.6	7.1	8.5	Der.	-998	-6.9	8.6
Cx/	Izq.	-998	-998	-998	Der.	-23	-7.3	-9.9
Pm1/	Izq.	6.6	5.1	7.1	Der.	5.7	5.4	6.9
Pm2/	Izq.	0			Der.	0		
Pm3/	Izq.	0		0	Der.	0		
Pm4/	Izq.	-14.9	9	-23.5	Der.	0		
M1	Izq.	0			Der.	10	15.5	20.2
M2	Izq.	4.5	7.7	11.8	Der.	5.4	-998	11.4

Dientes de leche? Si   Desgaste :

Notas: I3, Cx, Pm2, Pm3, Pm4, M1 y M2 eruptando en encia.

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	8.9	6.7	-7.5	Der.	11.7	7.1	6.9
I/3	Izq.				Der.			
C/x	Izq.	0			Der.	21.6	7	10.2
Pm/1	Izq.	4.9	4.5	5.7	Der.	5.3	4.9	5.8
Pm/2	Izq.	0			Der.	0		
Pm/3	Izq.	0			Der.	0		
Pm4/	Izq.	-9.8	7.4	14.6	Der.	0		
M1	Izq.	-18.2	10.5	-25.9	Der.	-16.4	9.8	-23.7
M2	Izq.	0			Der.	-998	-998	10.2
M3	Izq.				Der.			

Dientes de leche? Si   Desgaste

Notas: I2, I3, Pm3, M1 y M2 dentro del encia.

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0

Canid

No de Elemento:	1508	Capa:	CXV	Genus:	Canis
Entierro:	E.5	Class:	Mammalia	Specie:	lupus
Localidad:	T.8, E.5	Orden:	Carnivora	Age:	Juvenile
Asociacion:	5-C	Familia:	Canidae	Sex:	-998

Notes: Individuo 4 1/2 a 5 1/2 meses de edad. Muy mal estado de conservacion, solo se pudo reconstruir dientes y parte de la mandibula. Todos los dientes son permanetes aunque probablemente faltan formar un poco mas. Tambien se encontro fragmentos de hueso humano y un sesamoide de mamifero aunque en los fragmentos no pegados no se registro falanges ni garras. La edad se definio por la presencia de todos los dientes permanentes pero la chica dimencion del mandibula suguiere que pueda ser de un hibrido. Al inicio se identifico como un lobbero pero al ver las medidas de Pm3 y Pm4, parece que se trata de un lobo. Tenemos que ver mas detalles. Por el momento se dejo la identificacion como posible lobo.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Reconos 110, B-72

Notas sobre consoli Se aplico solo Reconos 110 por ser demasi

Elementos: Craneo y mandibula

Notas Elementos: Solo se pudo reconstruir dientes y identificar pocas fragmentos de craneo, mandibula y maxila. No se identifico fragmentos de neurocraneo.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	8.9	5.5	5.3	Der.	8.9	-998	-998
I2/	Izq.	10.9	6	6.4	Der.	10.9	6.2	6.4
I3/	Izq.	11.3	-5.6	-6.1	Der.	12.5	5.8	7.9

Canid

Longitud nasion-bas: 0 Ancho minimo inter: 0 Fuscion craneal:

Nivel de fusion de cr:

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	-998	-998
Longitud max:	-998	-998
Altura rama mand	-998	-998
Ancho rama mand	-998	34.8
Altura rama mand M1	-24.8	-998

Canid

Cx/	**Izq.**	-998	-998	-998	**Der.**	-998	-998	-998
Pm1/	**Izq.**	5.6	4.9	6.9	**Der.**	5.5	4.8	6.9
Pm2/	**Izq.**	7.2	4.9	12.6	**Der.**	7.1	5	12.7
Pm3/	**Izq.**	8	5.8	13.9	**Der.**	7.3	6	13.7
Pm4/	**Izq.**	0			**Der.**	0		
M1	**Izq.**	0			**Der.**	0		
M2	**Izq.**	0			**Der.**	0		

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	**Izq.**	0			**Der.**	6.8	3.4	4.4
I/2	**Izq.**	7.1	5	5.5	**Der.**	7.3	5	5.8
I/3	**Izq.**	9.5	5.7	6.6	**Der.**	9.5	5.2	6.7
C/x	**Izq.**	-20	-998	-998	**Der.**	-998	-998	-998
Pm/1	**Izq.**	5.2	4.8	5.5	**Der.**	4	4.3	5.7
Pm/2	**Izq.**	6	5	10.7	**Der.**	6.1	5.4	10.8
Pm/3	**Izq.**	7.3	5.8	12.5	**Der.**	7.8	5.9	12.7
Pm4/	**Izq.**	8.9	6.3	13.9	**Der.**	10.1	-7.9	14.2
M1	**Izq.**	12.8	9.3	24.6	**Der.**	13	9.4	24.4
M2	**Izq.**	6.9	7.8	11.3	**Der.**	0		
M3	**Izq.**	3.2	5.2	5.8	**Der.**			

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0

Canid

Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

No de Elemento:	1636.2	Capa:	CXV	Genus:	Canis
Entierro:	E.5	Class:	Mammalia	Specie:	lupus
Localidad:	T.8, E.5	Orden:	Carnivora	Age:	Juvenile
Asociacion:		Familia:	Canidae	Sex:	Male

Notes: Individuo probablemente fue completo aunque en muy mal estado de conservacion no nos permite confirmar si habia huesos faltantes. Habia dientes de felino mezclado entre este ejemplar de 1636.1. Se tomo una muetra de canino superior izquierda y diafisis de hueso largo para analisis quimico. Todos los huesos no fusionado. Solo aplico Reconos 110. Presencia de os penis confirma que fue macho. Por la presencia de solo dientes permanentes (termina eruptar a los 6 meses), la presencia de suturas craneales no fusionados (fusiona alrededor de 1 ano) y la ausencia de desgaste en los dientes asignamos como juvenile de 6-9 meses de edad.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Reconos 110, B-72

Notas sobre consoli solo aplico Reconos 110 y pego con B-72 p

Elementos: Individuo casi compl

Notas Elementos: Solamente se pudo pegar los pedazos de dientes. Unos fragmentos de craneo muestra pigmento rojo adherido. Los heuesos metapodiales tambien estan fragmentados y no es seguro la ubicaccion aisgnado en la diagrama por ser demasiado fragmentados. Por la fragmentaccion no se pudo confirmar la preencia de todos los elementos pero probablemente fue un indidivuo completo. No se pudo tomar medidas de ningun hueso poscraneal.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	9	5.7	6.7
I2/	Izq.	0			Der.	10.3	6.3	7.2
I3/	Izq.	12.4	6.9	8.2	Der.	13.6	7	8.1
Cx/	Izq.	22.3	8.3	10.4	Der.	24.6	7.3	11.1
Pm1/	Izq.	6.5	5.1	7.1	Der.	5.8	5	7.1
Pm2/	Izq.	7	5.6	13.1	Der.	7.11	6	13.3
Pm3/	Izq.	7.7	6.8	14.7	Der.	7.4	6.1	14.7
Pm4/	Izq.	14.1	9.7	23.7	Der.	14.6	-998	-998
M1	Izq.	9.4	20.5	15.3	Der.	-998	-19.5	-14.1
M2	Izq.	4.2	13.2	8.5	Der.	-998	-998	-998

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	7.1	3.6	5
I/2	Izq.	8.4	5.3	6.5	Der.	7.8	4.9	6.2
I/3	Izq.	0			Der.	10.4	5.9	7
C/x	Izq.	0			Der.	-998	-998	12.1
Pm/1	Izq.	4.4	4.6	5.6	Der.	0		
Pm/2	Izq.	6.6	5.1	11.2	Der.	6.3	5.1	11.6
Pm/3	Izq.	7.1	5.4	13.6	Der.	6.8	5.3	13.2
Pm4/	Izq.	9.4	7.3	15	Der.	9.7	7.5	15
M1	Izq.	14.7	10.9	27.1	Der.	14.8	10.7	26.8
M2	Izq.	5.9	8.3	11.6	Der.	6.1	8.2	11.5
M3	Izq.	3.6	5.6	5.8	Der.	4.1	6	6.1

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cr: -998 Ancho del craneo: -998 Ancho biorbital: -998

Canid

No de Elemento:	PPS209	Capa:	VIII	Genus:	Canis
Entierro:	O.2	Class:	Mammalia	Specie:	lupus
Localidad:	F.C, O.2, T.3	Orden:	Carnivora	Age:	Infant/juvenile
Asociacion:	P.59	Familia:	Canidae	Sex:	-998

Notes: 4-5 meses de edad, individuo muy joven, varias dientes deciduas y su craneo no esta fusionado. Varias huellas presentes. Se ve una corte un poco abajo de la cresta nucal y varias huellas de corte (vea dibujo).

Modificaciones del superficie

Mod Presente?	True	# de patologias:	
# de huellas:	15	Ubicacion de pat:	
Ubicacion:	Craneo y mandi	# de mod	
		Ubicacion mod.	

Notas: Se presenta varias huellas de corte en los parietales de los dos lados, hueso frontal izquierda y debajo del arco cigomatico izquierda, probablemente porque su piel fue extraido. Posible corte en cresta nucal, se trata de un orificio cortado a la altura de la cresta nucal para extraer la masa ensefarica.

Consolidantes

Uso consolidante?:	No		
Que tipo?			
Notas sobre consoli	No se aplico consolidantes, solo se lavo co	Elementos	Craneo y mandibula

Notas Elementos: No se identifico fragmentos ocipitales ni partes arededor del foramen magnum, probablemente porque, por la presencia de un parte que presenta un corte arqueologico por la cresta nucal, se trata de un orificio cortado a la altura de la cresta nucal para extraer la masa ensefarica (vea linea paunteado en la vista dorsal del craneo).

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	**Izq.**	8.8	5.6	6.2	**Der.**	8.8	5.6	6.8
I2/	**Izq.**	10.9	6.5	7.1	**Der.**	11.1	6.5	6.9
I3/	**Izq.**	12.5	6.2	8.1	**Der.**	12.7	6.9	8

Canid

Longitud basal:	-998	Ancho de los arcos z	-998	Ancho minimo front	-998
Largo del paladar:	-998	Ancho auricular:	-998	Longitud facial:	-998
Ancho maximo del p	-998	Ancho frontal:	-998	Curva nasal:	-998
Longitud nasion-bas	-998	Ancho minimo inter	-998	Fuscion craneal:	3
				Nivel de fusion de cr	7

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	-998	-998
Longitud max:	-998	-998
Altura rama mand	-998	-998
Ancho rama mand	-998	-998
Altura rama mand M1	-998	-19.1

Canid

Cx/	**Izq.**	22.2	7.6	11.6	**Der.**	23.6	6.6	10.4
Pm1/	**Izq.**	5.7	4.6	6.7	**Der.**	5.7	4.5	6.8
Pm2/	**Izq.**	7.9	5.7	12.7	**Der.**	0		
Pm3/	**Izq.**	9.8	7	13.8	**Der.**	0		
Pm4/	**Izq.**	0			**Der.**	0		
M1	**Izq.**	9.4	19.7	14.9	**Der.**	9.9	17.3	14.5
M2	**Izq.**	5	10.7	7.7	**Der.**	4.8	10.9	7.9

Dientes de leche? Si Desgaste :

Notas: I3, Cx, Pm2, 3, y 4, M1 y 2 en erupcion

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	**Izq.**	7.1	3.4	4.6	**Der.**	7.3	3.4	4.7
I/2	**Izq.**	7.7	4.9	5.9	**Der.**	7.4	4.6	5.6
I/3	**Izq.**	9.9	6.1	6.5	**Der.**	10	6.3	6.5
C/x	**Izq.**	0			**Der.**	-25.3	-998	-998
Pm/1	**Izq.**	4.8	4.5	5.7	**Der.**	4.8	4.4	5.4
Pm/2	**Izq.**	0			**Der.**	6.9	5.1	10.5
Pm/3	**Izq.**	0			**Der.**	0		
Pm4/	**Izq.**	0			**Der.**	0		
M1	**Izq.**	0			**Der.**	15	9.8	25.1
M2	**Izq.**	0			**Der.**	0		
M3	**Izq.**				**Der.**			

Dientes de leche? Si Desgaste

Notas Cx, Pm2, M1 y M2 en erupcion.

Medidas Craneo:

Longitud maxima cr	-998	Ancho del craneo:	37.3	Ancho biorbital:	-998
Longitud basal:	-998	Ancho de los arcos z	-998	Ancho minimo front	41.9
Largo del paladar:	-998	Ancho auricular:	-83.4	Longitud facial:	-998
Ancho maximo del p	-92	Ancho frontal:	-998	Curva nasal:	-998

Canid

Longitud nasion-bas	-998	Ancho minimo inter	33.5	Fuscion craneal:	3
				Nivel de fusion de cr	7

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	135.1	135.5
Longitud max:	139.3	139.1
Altura rama mand	-998	-998
Ancho rama mand	34.5	34.9
Altura rama mand M1	25.6	26.1

Canid

No de Elemento:	2199	Capa:	LXXXI	Genus:	Canis
Entierro:	E.6	Class:	Mammalia	Specie:	lupus
Localidad:	T.12, E.6	Orden:	Carnivora	Age:	Juvenile
Asociacion:	N3-31	Familia:	Canidae	Sex:	Female

Notes: Canido muy deteriorado aunque completo, con el se encontraron restos de un felino, muy probablemente un puma de un elemento cercano, se corresponden a cuboide, navicular, calcaneos y astragalos derechos e izquierdos. Al inicio se identifico como un hibrido pero al ver las medidas de Pm3 y Pm4, se que que se corresponde a un lobo. Tenemos que ver con mas detalle este individuo. Por el momento se identifico como posible lobo.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Reconos 110+220, Resistol 850

Notas sobre consoli La mayoria todavía en bloques originales l   Elementos Individuo casi compl

Notas Elementos:

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	8.7	5.5	5.8	Der.	0		
I2/	Izq.	11	6.2	6.4	Der.	11	6	6.5
I3/	Izq.	13.9	6.6	6	Der.	0		
Cx/	Izq.	-999	-999	-999	Der.	0		
Pm1/	Izq.	7.5	-998	7.2	Der.	0		
Pm2/	Izq.	7.8	-998	11.7	Der.	0		

Canid

Pm3/	Izq.	7.9	-998	13	Der.	0		
Pm4/	Izq.	13.4	9.7	21	Der.	0		
M1	Izq.	7.7	19.9	14.5	Der.	0		
M2	Izq.	0			Der.	0		

Dientes de leche? No   Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	7.5	4.7	4	Der.	0		
I/2	Izq.	8	5.8	5.6	Der.	0		
I/3	Izq.	9.1	6.3	6.2	Der.	0		
C/x	Izq.	21.1	7.5	8.2	Der.	0		
Pm/1	Izq.	4.7	-998	5.6	Der.	0		
Pm/2	Izq.	6.6	-998	10.3	Der.	0		
Pm/3	Izq.	7.6	-998	12.1	Der.	0		
Pm4/	Izq.	10.4	-998	13.2	Der.	0		
M1	Izq.	14.5	10.3	25.4	Der.	0		
M2	Izq.	0			Der.	0		
M3	Izq.				Der.			

Dientes de leche? No   Desgaste

Notas

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	93.1
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	-998
				Nivel de fusion de cr	-998

Medidas Mandibula:

	Izq.	Der.

Canid

No de Elemento:	573.1	Capa:	CCLXI	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Adult
Asociacion:	Animal VI, NW	Familia:	Canidae	Sex:	-998

Notes: Muy fragmentado y muy pegajoso por una consolidante con tierra, la cual se limpio poquito con acetona. Todos los dientes son permanentes sin evidencia de mucha desgaste, por la cual se asigno como juvenile/adulto. Tambien estaba mezclado con estos materiales un falange distal de felino.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido superficie

Elementos: Craneo y mandibula

Notas Elementos:

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	9.1	5.5	5.9	Der.	9.2	4.7	5.9
I2/	Izq.	11.7	-998	7.4	Der.	11.7	6.7	7.1
I3/	Izq.	14.8	7.7	8.3	Der.	15.2	5.6	8.4
Cx/	Izq.	-26.5	8.6	12.1	Der.	27.2	9.4	12.9
Pm1/	Izq.	0			Der.	7.2	6	7.8
Pm2/	Izq.	8.6	5.7	15.3	Der.	8.6	5.9	14.8
Pm3/	Izq.	9	6.7	15.3	Der.	9	6.3	16.2

Canid

Longitud de mand	140.4	0
Longitud max:	141.7	0
Altura rama mand	40.9	0
Ancho rama mand	0	0
Altura rama mand M1	21.8	0

Canid

Pm4/	**Izq.**	19.6	-998	-998	**Der.**	19.2	10.1	26
M1	**Izq.**	11.8	18.4	16.7	**Der.**	11.4	18.6	15.7
M2	**Izq.**	-998	-998	-998	**Der.**	5.4	12.3	9.1

Dientes de leche? No   Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	**Izq.**	0			**Der.**	7.2	3.5	5.1
I/2	**Izq.**	8.1	4.8	6.5	**Der.**	8.6	4.7	6.4
I/3	**Izq.**	10.8	6.2	7	**Der.**	10.9	6.5	7
C/x	**Izq.**	-998	-998	-998	**Der.**	-24.6	-998	14.2
Pm/1	**Izq.**	5.7	5.2	5.7	**Der.**	6.3	5	5.7
Pm/2	**Izq.**	8.2	5.5	12.2	**Der.**	8.3	5.8	12.5
Pm/3	**Izq.**	8.7	6	14.2	**Der.**	8.9	6.1	14.4
Pm4/	**Izq.**	11	7.7	16.1	**Der.**	10.9	7.5	15.7
M1	**Izq.**	18.1	11.2	26.6	**Der.**	18	11.2	28
M2	**Izq.**	8.4	9	12.6	**Der.**	8.6	8.8	12.6
M3	**Izq.**	4.8	6.2	6.4	**Der.**	5.3	6.2	6.4

Dientes de leche? No   Desgaste

Notas

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	0	0

Canid

Longitud max:	0	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

No de Elemento:	578.1	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Adult
Asociacion:	Animal XI, SE	Familia:	Canidae	Sex:	-998

Notes: Craneo muy fragmentado, mandibula reconstruido. Dientes permanentes y poco desgastado. Hubo material de felino mezclado en los materiales (Ele 578.2).

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido, se pego p

Elementos Craneo y mandibula

Notas Elementos: Craneo y dientes muy fragmentado.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	-8.1	6.2	-998
I2/	Izq.	-998	-998	-998	Der.	11.2	7	7.4
I3/	Izq.	-998	-998	-998	Der.	14.9	8.1	8.9
Cx/	Izq.	-998	-998	-998	Der.	-998	-998	-998
Pm1/	Izq.	0			Der.	0		
Pm2/	Izq.	-998	-5.9	-14.6	Der.	-9	-6.4	15
Pm3/	Izq.	-9.4	-998	-15.3	Der.	-9.6	-998	16.9
Pm4/	Izq.	-14.4	-11	-24.6	Der.	15.5	10.3	-998

Canid

M1	Izq.	-998	-998	-998	Der.	10.5	16.3	18.7
M2	Izq.	-998	-998	-998	Der.	4	11.6	-8

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	Izq.	0			Der.	0		
I/2	Izq.	0			Der.	0		
I/3	Izq.	-998	-998	-998	Der.	0		
C/x	Izq.	-998	9	-12.6	Der.	25.5	-998	-13.4
Pm/1	Izq.	-998	-998	-6.1	Der.	-998	-998	-6.3
Pm/2	Izq.	8.2	5.1	12	Der.	-998	-998	13.2
Pm/3	Izq.	8.1	6.1	14.7	Der.	0		
Pm4/	Izq.	11.2	7.7	-15.9	Der.	10.2	-998	17.6
M1	Izq.	16.3	12.1	29.3	Der.	-998	12.8	-998
M2	Izq.	-998	-8.5	11.5	Der.	-998	8.5	-998
M3	Izq.				Der.			

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0

Canid

No de Elemento:	574.1	Capa:	CCLXIII	Genus:	Canis
Entierro:	E.3	Class:	Mammalia	Specie:	lupus
Localidad:	T.2, E.3	Orden:	Carnivora	Age:	Adult
Asociacion:	Animal VII, SW	Familia:	Canidae	Sex:	-998

Notes: Individuo totalmente fragmentado, solo se reconstuyo su mandibula y los dientes. Habia fragmentos de felino mezclado con estos materiales (vea cedula de Ele 574.2). Por la presencia de solo dientes permanentes y la presencia de desgaste en unos dientes pensamos que es un adulto. Materiales ya fue consolidado cuando recibimos los materiales.

Modificaciones del superficie

Mod Presente?	False	# de patologias:	
# de huellas:		Ubicacion de pat:	
Ubicacion:		# de mod	
		Ubicacion mod.	

Notas:

Consolidantes

Uso consolidante?: Si

Que tipo? Otros no identificado

Notas sobre consoli Probablemente resistol deluido, se pego p

Elementos: Craneo y mandibula

Notas Elementos: Totalmente fragmentado pero las partes identificado son de la parte facial y maxilar, no hay fragmentos de neurocraneo. Mandibula izqueirda bien conservado.

Medidas dentales (maxilares):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I1/	Izq.	0			Der.	0		
I2/	Izq.	0			Der.	0		
I3/	Izq.	12.4	5.7	-7.2	Der.	0		
Cx/	Izq.	21.8	-8.4	10.3	Der.	23.9	8	12.1
Pm1/	Izq.	5.9	5.6	7.7	Der.	6	5.9	7.8

Canid

Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Canid

Pm2/	**Izq.**	7.7	5.9	12.7	**Der.**	8	5.7	12.7
Pm3/	**Izq.**	0		0	**Der.**	8.8	7.1	14.2
Pm4/	**Izq.**	-998	-998	-998	**Der.**	0		
M1	**Izq.**	0			**Der.**	9.2	17.7	17.5
M2	**Izq.**	0			**Der.**	4.6	12.5	8.7

Dientes de leche? No Desgaste :

Notas:

Medidas dentales (mandibulas):

Pieza	Lado	Altura	Ancho	Long	Lado	Altura	Ancho	Long
I/1	**Izq.**	0			**Der.**	0		
I/2	**Izq.**	-998	4.4	-4.6	**Der.**	0		
I/3	**Izq.**	11.3	5.2	-998	**Der.**	0		
C/x	**Izq.**	22	8.8	11.3	**Der.**	22	8.4	11.7
Pm/1	**Izq.**	4.5	4.6	5.6	**Der.**	4.5	4.9	5.9
Pm/2	**Izq.**	6.7	5.6	10.7	**Der.**	6.7	5.7	10.6
Pm/3	**Izq.**	8.2	6.7	13.5	**Der.**	8.3	6.6	13.2
Pm4/	**Izq.**	10.1	7.6	15	**Der.**	9.9	8	15
M1	**Izq.**	15.4	10.2	26.7	**Der.**	14.9	10.4	27.1
M2	**Izq.**	6.7	8	12.2	**Der.**	6.8	8.7	12.5
M3	**Izq.**				**Der.**			

Dientes de leche? No Desgaste

Notas

Medidas Craneo:

Longitud maxima cr		Ancho del craneo:	0	Ancho biorbital:	0
Longitud basal:	0	Ancho de los arcos z	0	Ancho minimo front	0
Largo del paladar:	0	Ancho auricular:	0	Longitud facial:	0
Ancho maximo del p	0	Ancho frontal:	0	Curva nasal:	0
Longitud nasion-bas	0	Ancho minimo inter	0	Fuscion craneal:	
				Nivel de fusion de cr	

Medidas Mandibula:

Canid

	Izq.	Der.
Longitud de mand	0	0
Longitud max:	0	0
Altura rama mand	0	0
Ancho rama mand	0	0
Altura rama mand M1	0	0

Appendix F: Bird data forms

AVE

No de Elemento:	1638.1	Entierro:	E.5	Class:	Aves	Age:	Adult
Specnumber:	165	Localidad:	T.8, E.5	Orden:	Accipitriformes	Sex:	-998
Tipo de Material:	6	Asociacion:	5-C	Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.16	Capa:	CXV	Genus:	Aquila		
No de Bolsa:		Elevation:		Specie:	chrysaetos		

Notes: Muy fragmentado, solo se pudo reconstruir varias huesos largos y las falanges y garras. Estaba mezclado fragmentos de falange de felino y de un ae mas chico (puede ser de cuervo 1637).

Modificaciones del superficie

Mod presente? False

Ubicacion

de huellas

de patologias:

Ubicacion

modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Si

Que tipo: Reconos 110, B-72

Notas: No se consolido las patas (metatarso, falanges y garras). Solo se aplico Reconos

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	-998
Ancho interorbital:	-998
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	0
Radio	-998	-998
Ulna	-998	0
Carpomet	0	0

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	0	0
Falange 2	0	0
Digito 3	0	0
Polex	0	0

Elementos anatomicos posteriores

Femur	-998	-998
Tibiotarso	-998	-998
Fibula	0	0
Tarsomet	-998	-998
TM Prox W	-998	-998

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	33.7	33.8							-29.2	-998
II	7.7	8	28.3	27.1					-30.4	31.5
III	24.2	-998	9.8	-998	23.8	24.3				21.7
IV	-998	-998	5	0	0	0	17.3	17.3	17.9	-998

AVE

No de Elemento:	PPS211.1	Entierro:	O.2	Class:	Aves	Age:	Adult
Specnumber:	196	Localidad:	F.C, O.2, T.3	Orden:	Accipitriformes	Sex:	Male
Tipo de Material:	6	Asociacion:	P.59	Familia:	Accipitridae	Body part	Complete
No de Catalogo:	PPS.Ba.O.19	Capa:	VIII	Genus:	Aquila		
No de Bolsa:	10C-4475	Elevation:		Specie:	chrysaetos		

Notes: Profundidad 2292.81-2292.73msnm. Individuo completo aunque fragmentado. No se observo huellas de cortes u otros modificaciones de superficie aunque durante la limpieza se noto la prsencia de material organico adherido a los huesos incluyendo fragmento de material vegetal asociado que se guardo aparte. La identificacion del sexo basado en la forma de tarsometatarso. Dos conejos y 5 fragmentos de otro animal no identificado (ave?) dentro del contenido estomacal.

Modificaciones del superficie

Mod presente? False

Ubicacion

de huellas

de patologias:

Ubicacion

modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: No

Que tipo

Notas: No se uso consolidantes, solo Paraloid B-72 para pegamento.

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	-998
Ancho interorbital:	-998
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	177.6	-998
Radio	190.6	195.6
Ulna	203	202
Carpomet	-998	91.6

AVE

Medidas de la vertebra

Atlas:	-998	1a Tor	11.6
Axis:	8.7	2a Tor	9.8
3a Cerv:	8.5	3a Tor	
4a Cerv:	15.3	4a Tor	
5a Cerv:	15.1	1a Lum	15.2
6a Cerv:	14.5	2a Lum	15.1
7a Cerv:	13.7	3a Lum	15.5
8a Cerv:	13.1	4a Lum	12.3
9a Cerv:	11.7	5a Lum	14.1
10a Cerv:	0	1a Cocc	8.3
11a Cerv:	0	2a Cocc	9.1
12a Cerv:	0	3a Cocc	9.8
		4a Cocc	6.8
		5a Cocc	7.3
		Pigost	11.3

Fusion de vert

Falange 1	33.1	63.6
Falange 2	31.5	31
Digito 3	16.3	16
Polex	24.3	24.2

Elementos anatomicos posteriores

Femur	115	116
Tibiotarso	159	157
Fibula	-998	-998
Tarsomet	95.5	93
TM Prox W	20.8	21

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	35.5	35.6							37.3	36.9
II	7.6	7.6	28.6	28					31.8	32.1
III	24.8	-998	10.8	10.6	23.9	23.6			23.7	22.5
IV	11.8	12.3	5.3	6.1	4.7		18.7	-998	18.9	19.3

AVE

No de Elemento:	2222	Entierro:	E.6	Class:	Aves	Age:	-998
Specnumber:	229	Localidad:	E.6, T.12	Orden:	Accipitriformes	Sex:	-998
Tipo de Material:	6	Asociacion:		Familia:	Accipitridae	Body part	Various
No de Catalogo:		Capa:		Genus:	Aquila		
No de Bolsa:		Elevation:		Specie:	chrysaetos		

Notes: Incomplete individual, need to check if part of other element.

Modificaciones del superficie

Mod presente? False

Ubicacion

de huellas

de patologias:

Ubicacion

modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Yes

Notas:

Que tipo: Reconos 110+220, Resistol 850

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	0
Ancho interorbital:	0
Longitud mand:	0

Elementos anatomicos toraxicos

	Izq	Der
Humero	0	0
Radio	0	0
Ulna	0	0
Carpomet	0	0

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	0	0
Falange 2	0	0
Digito 3	0	0
Polex	0	0

Elementos anatomicos posteriores

Femur	0	0
Tibiotarso	0	0
Fibula	0	0
Tarsomet	0	0
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	0	0								
II	0		0	0						
III	0	0	0	0	0	0				
IV	0	0	0	0	0	0	0	0		0

AVE

No de Elemento:	1983	Entierro:	E.6	Class:	Aves	Age:	Adult
Specnumber:	13	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	Male
Tipo de Material:	6	Asociacion:	N5-31	Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.13	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: Individuo completo, en buen estado de conservacion. En las piezas oseas se observa manipulacion (corte, fractura y perforacion). En el craneo se observa una factura en la parte del nuerocraneo.

Modificaciones del superficie

Mod presente?	True	Ubicacion	craneo, humero x2, ulna, femur x2, tibiotarso y fibula.
# de huellas	50		
# de patologias:			
Ubicacion			
# modificaciones:	2		

Ubicacion: Fractura en craneo, perforacion en ulna derecha epifisis distal.

Notas modificaciones: Neurocraneo hay una fractura interncional, el humero derecho se notan marcas de corte en ambas caras de la pieza, y el humero izquierdo solo en la cara anterior, en la ulna derech en la epifisis distal existe una perforacion (1.62cm), y en las piezas del tibiotarso derecho e izquierdo al igual que el femur de ambos lados, tanto en la cara anterior y posterior existen multiples marcas de cortes.

Consolidantes

Uso consolidante?: Si

Que tipo: Reconos 110, B-72

Notas:

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	0
Ancho interorbital:	0
Longitud mand:	86

Elementos anatomicos toraxicos

	Izq	Der
Humero	183.8	182.6
Radio	195.6	197.9
Ulna	196.9	195.6
Carpomet	94.8	95.2

AVE

Medidas de la vertebra

Atlas:	10	1a Tor	13.6
Axis:	6.2	2a Tor	14.1
3a Cerv:	10.5	3a Tor	14.5
4a Cerv:	14.1	4a Tor	14.6
5a Cerv:	15	1a Lum	
6a Cerv:	14.8	2a Lum	
7a Cerv:	12.3	3a Lum	
8a Cerv:	14.7	4a Lum	
9a Cerv:	15.2	5a Lum	
10a Cerv:	13.4	1a Cocc	5.8
11a Cerv:	12	2a Cocc	7.9
12a Cerv:	13	3a Cocc	7.7
		4a Cocc	7.5
		5a Cocc	7.1
		Pigost	9.8

Fusion de vert

Falange 1	32.2	32.2
Falange 2	32.5	33.3
Digito 3	15.3	16.2
Polex	24.1	24.5

Elementos anatomicos posteriores

Femur	-118.4	120.3
Tibiotarso	156.1	157.9
Fibula	-998	120.7
Tarsomet	0	98.8
TM Prox W		20.56

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	36.7	35.8							38	36.4
II	7.8	7.8	28.3	27.5					32.5	32.6
III	25.3	25.4	23.1	23.2	11.4	11.2			24.5	24.1
IV	13.5	11.7	6.1	6.5	5.3	5.2	17.7	17.6	18.1	19.3

AVE

No de Elemento:	2010	Entierro:	E.6	Class:	Aves	Age:	-998
Specnumber:	14	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	Male
Tipo de Material:	6	Asociacion:	N5-33	Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.14	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: Huesos muy deteriorada. El neurocráneo presenta una zona fractuara como sucede con el cráneo de los pumas para extraer el cerebro, con huellas de corte en la zona de la cueva orbitaria (ojo derecho).

Modificaciones del superficie

Mod presente? True

de huellas: 10

Ubicacion: craneo y humero izquierda

de patologias:

Ubicacion:

modificaciones: 1

Ubicacion: orificio en ocipital

Notas modificaciones: Hay un conjunto de marcas alrededor de la cuenca ocular derecha, algunas parecen ser huellas de corte y algunas como natural. Hay un orificio en el occipital donde parece ser desnucada el ave. Otro hueso, quizas un hueso accesorio de la mandibula tambien tiene un conjunto de huellas de corte. El humero izquierdo tambien presenta un conjunto de huellas de corte en la diafisis proximal.

Consolidantes

Uso consolidante?: Si

Que tipo: Reconos 110+220, Resistol 850

Notas:

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	0
Ancho interorbital:	0
Longitud mand:	94.5

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	181
Radio	216	-998
Ulna	224	223
Carpomet	-998	-998

AVE

Medidas de la vertebra

Atlas:	4.1	1a Tor	
Axis:	11.2	2a Tor	
3a Cerv:	11.9	3a Tor	
4a Cerv:	12.4	4a Tor	
5a Cerv:	13.3	1a Lum	
6a Cerv:	-998	2a Lum	
7a Cerv:	-998	3a Lum	
8a Cerv:	16.8	4a Lum	
9a Cerv:	16.7	5a Lum	
10a Cerv:	16.3	1a Cocc	
11a Cerv:	15.8	2a Cocc	
12a Cerv:	16.1	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	-36.2

Fusion de vert:

Falange 1	42.5	42
Falange 2	35.8	36.3
Digito 3	0	0
Polex	29.9	30.2

Elementos anatomicos posteriores

Femur	-998	-998
Tibiotarso	-998	-158
Fibula	0	119
Tarsomet	-103	-100
TM Prox W	21.1	-18.38

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	37.2	36.4							-42.9	47.9
II	0	8.4	32.2	32.4					40.2	40.3
III	0	26.7	11.6	11.7	25	25.2			26.3	26.1
IV	13.1	0	5.5	5.6	4.4	4.6	19.4	19.6	25	24.2

AVE

No de Elemento:	2047	Entierro:	E.6	Class:	Aves	Age:	Adult
Specnumber:	180	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	Poss. Female
Tipo de Material:	6	Asociacion:	N3 C32-33	Familia:	Accipitridae	Body part	Head and extremities
No de Catalogo:	PPL.Ba.O.18	Capa:		Genus:	Aquila		
No de Bolsa:		Elevation:		Specie:	chrysaetos		

Notes: Por las partes anatomicas que unicamente se han hallado pareciera ser resutlado de la elaboracion de una piel, ademas, posiblemente se cubrio de un pigmento rojo por lo pocos residuos encontrados en los huesos. Los huesos tomados para muestra quimica son el tarsometatarso derecho y un fragmento de ulna.

Modificaciones del superficie

Mod presente?	True	Ubicacion	Ulna esquierda
# de huellas	2		
# de patologias:			
Ubicacion			
# modificaciones:	1		
Ubicacion:	pigmento rojo		
Notas modificaciones:	2 cortes en parte proximal ulna izquierda y pigmento rojo en ulna derecha. Posiblemente el craneo fue preparado.		

Consolidantes

Uso consolidante?:	Si	Notas:	
Que tipo	Reconos 110+220, Resistol 850		

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	0
Ancho interorbital:	49.3
Longitud mand:	91.4

Elementos anatomicos toraxicos

	Izq	Der
Humero	0	0
Radio	0	218.1
Ulna	0	0
Carpomet	105.3	102.3

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0
Fusion de vert			

Falange 1	39.1	40.3
Falange 2	33.3	33.7
Digito 3	15.9	0
Polex	0	0

Elementos anatomicos posteriores

Femur	0	0
Tibiotarso	0	0
Fibula	0	0
Tarsomet	0	102.6
TM Prox W		
Fusion hueso largo:		

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	-36.3	38.9							-34.5	39.1
II	0	15.3	32.9	33.4					40.4	29.3
III	27.7	27.4	14.7	13.7	27.6	27.8			30.5	29.3
IV	13.9	-12.7	8.1	0	6.3	6.9	19.8	19.2	22.9	22.2

AVE

No de Elemento:	1961.1	Entierro:	E.6	Class:	Aves	Age:	-998
Specnumber:	2	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	Female
Tipo de Material:	6	Asociacion:	N2-31	Familia:	Accipitridae	Body part	Complete
No de Catalogo:	PPL.Ba.O.2	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: El ejemplar presenta alteración en los elementos anatómicos excepto las extremidades inferiores, por una patología en el tarsometatarso izquierdo, en la diáfisis, cara medial, presenta alteración en la superficie por posible infección y/o trauma. Se encontro huesos de conejo (vea Ele 1961.2) en el contenido estomacal que fue cocido. Tarsometatarso muy grande con las marcas musculares muy prominentes, por lo tanto pensamos que es una hembra.

Modificaciones del superficie

Mod presente? True

Ubicacion

\# de huellas

\# de patologias: 1

Ubicacion: Tarsometatarso izq

\# modificaciones:

Ubicacion:

Notas modificaciones: Patologia en la cara medial en la diafisis, posiblemente por estar amarado con una cuerda.

Consolidantes

Uso consolidante?: Si

Notas:

Que tipo: Reconos 110+220, Resistol 850

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	0
Ancho interorbital:	0
Longitud mand:	0

Elementos anatomicos toraxicos

	Izq	Der
Humero	0	0
Radio	0	221
Ulna	234	233
Carpomet	0	0

AVE

Medidas de la vertebra

Atlas:	5.4	1a Tor	-998
Axis:	10.7	2a Tor	-998
3a Cerv:	11	3a Tor	-998
4a Cerv:	-998	4a Tor	-998
5a Cerv:	-998	1a Lum	-998
6a Cerv:	16.6	2a Lum	-998
7a Cerv:	17.1	3a Lum	-998
8a Cerv:	17.5	4a Lum	-998
9a Cerv:	14.3	5a Lum	-998
10a Cerv:	15.2	1a Cocc	10.3
11a Cerv:	-998	2a Cocc	10.2
12a Cerv:	-998	3a Cocc	9.3
		4a Cocc	8.2
		5a Cocc	8.3
		Pigost	0

Fusion de vert

Falange 1	0	41.6
Falange 2	36.3	36.7
Digito 3	0	0
Polex	30.9	30.3

Elementos anatomicos posteriores

Femur	132	133
Tibiotarso	178	178
Fibula	142	140.2
Tarsomet	107	106
TM Prox W	23.1	23.2

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	37.2	36.5							45	48.7
II	8.3	8.5	28.6	27.4					40	42.3
III	25.3	25.4	10.5	10.8	24.6	24.3			30	29.4
IV	11.8	11.6	4.6	5.8	4.2	4.9	17.4	17.3	22.3	22.5

AVE

No de Elemento:	2200	Entierro:	E.6	Class:	Aves	Age:	Adult
Specnumber:	3	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	Poss. Female
Tipo de Material:	6	Asociacion:		Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.3	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: Existe material adherido al hueso (tibiotarso derecho), talvez material organica, tambien en radio derecho y en femur derecho. Se tomo tarsometatarso izquierda y fragmento de humero derecho para analisis quimico.

Modificaciones del superficie

Mod presente? False

Ubicacion

de huellas

de patologias:

Ubicacion

modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Si

Notas:

Que tipo: Reconos 110+220, Resistol 850

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	-998
Ancho interorbital:	-998
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	-187
Radio	202.1	-199
Ulna	211.3	211.4
Carpomet	-998	102.3

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	-998	36
Falange 2	-998	33.3
Digito 3	-998	27.1
Polex	-998	15.5

Elementos anatomicos posteriores

Femur	-998	-122.3
Tibiotarso	0	163.2
Fibula	0	-112.8
Tarsomet	-998	99.7
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	37.4	37.5							36	40.1
II	11.7	11.6	29.3	29.5					33.4	35.3
III	-998	26.3	11.9	-998	-998	25.4			25.7	-998
IV	-998	-998	5.9	6.6	5	0	19.4	20	20.1	20.3

AVE

No de Elemento:	1962	Entierro:	E.6	Class:	Aves	Age:	-998
Specnumber:	18	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	-998
Tipo de Material:	6	Asociacion:		Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.18	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: Fragmentos de craneo con perforacion en el neurocraneo. Huella de corte en el tibiotarso izq.

Modificaciones del superficie

Mod presente?	True	Ubicacion	tibiotarso izquierda
# de huellas	5		
# de patologias:			
Ubicacion			
# modificaciones:			
Ubicacion:			

Notas modificaciones: Huellas de corte en la parte distal de tibiotarso izquierdo, la cual nos suguiere que fue cortado para paralizar las garras de este ave por cortar las ligamentos presentes en esta region.

Consolidantes

Uso consolidante?: Si

Notas:

Que tipo: Reconos 110+220, Resistol 850

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	-998
Ancho interorbital:	-998
Longitud mand:	-84.6

Elementos anatomicos toraxicos

	Izq	Der
Humero	0	-998
Radio	195	0
Ulna	0	210
Carpomet	-998	0

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:	8.5	2a Tor	
3a Cerv:	8.4	3a Tor	
4a Cerv:	10.9	4a Tor	
5a Cerv:	14.3	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	16.2	4a Lum	
9a Cerv:	16	5a Lum	
10a Cerv:	15.5	1a Cocc	
11a Cerv:	15.7	2a Cocc	7.3
12a Cerv:	0	3a Cocc	7.4
		4a Cocc	7.1
		5a Cocc	7.4
		Pigost	12

Fusion de vert

Falange 1	0	0
Falange 2	32.5	0
Digito 3	0	0
Polex	0	0

Elementos anatomicos posteriores

Femur	-998	-998
Tibiotarso	-150	-158
Fibula	0	-110
Tarsomet	102	106
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	34.7	33.9							34.7	-31.1
II	7.6	7.9	28.2	27.7					32	36.9
III	24.9	24.5	9.6	9.3	24	24			26.4	24.7
IV	11.9	11.4	5.2	5	5.4	5.8	18.4	18.4	20.2	19.9

AVE

No de Elemento:	2239	Entierro:	E.6	Class:	Aves	Age:	Adult
Specnumber:	19	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	Female
Tipo de Material:	6	Asociacion:	N4-34	Familia:	Accipitridae	Body part	Extremities
No de Catalogo:	PPL.Ba.O.19	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: Las piezas para el analisis quimico fueron el tarsometatarso derecho y un fragmento de la parte dista del humero izquierdo. A saber que, las piezas faltantes son la mayoria que conforman el cuerpo y parte de los huesos largos que son coneccion a las cinturas pelvica y escapular. Es posible que el craneo se encuentre en otra caja. Por la marcas culturales se presume la preparacion de piel.

Modificaciones del superficie

Mod presente? True

Ubicacion: Humero izquierdo, tarsometatarso izquierda

de huellas: 4

de patologias:

Ubicacion:

modificaciones: 1

Ubicacion: Fractura arqueologico en ulna izquierda

Notas modificaciones: Tres cortes en diafisis distal del humero izquierdo y unas fracturas posiblemente que fue colocado durante la preparacion del piel. Ulna derecha se encontro fragmentada la parte proximal con posible fracturas arqueological tal vez relacionado con el trabajo de la piel. La pieza del tarsometatarso fue tomada para muestra quimica. En la cara ventral del tarsometatarso izquierda hay huellas de corte posiblemente para la preparacion de piel.

Consolidantes

Uso consolidante?: Si

Notas:

Que tipo: Reconos 110+220, Resistol 850

AVE

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	0
Ancho interorbital:	0
Longitud mand:	0

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert:

Elementos anatomicos toraxicos

	Izq	Der
Humero	0	0
Radio	213.4	210.7
Ulna	227.6	-211.9
Carpomet	107.3	108.2
Falange 1	36.7	37.8
Falange 2	0	0
Digito 3	0	0
Polex	31.2	34.4

Elementos anatomicos posteriores

Femur	0	0
Tibiotarso	0	0
Fibula	0	0
Tarsomet	104.5	0
TM Prox W	23.3	

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	38.8	39.2							41.1	46.6
II	13.6	15.8	35.1	35.3					-36.9	42.5
III	29.2	26.6	13.1	13.7	-21.7	29.5			28.6	29.1
IV	13.4	13.3	6.4	5.8	7.2	7.4	####	27.4	21.3	21.8

AVE

No de Elemento:	144	Entierro:	E.2	Class:	Aves	Age:	Adult
Specnumber:	51	Localidad:	T.2, E.2	Orden:	Accipitriformes	Sex:	Poss. Female
Tipo de Material:	6	Asociacion:	E.2.6, Ave5	Familia:	Accipitridae	Body part	Complete
No de Catalogo:	PPL.Ba.O.51	Capa:	LXXI	Genus:	Aquila		
No de Bolsa:		Elevation:		Specie:	chrysaetos		

Notes: Individuo completo, bien conservado.

Modificaciones del superficie

Mod presente? False

Ubicacion

\# de huellas

\# de patologias:

Ubicacion

\# modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Si

Notas: Probablemente resistol deluido.

Que tipo: Other UnID

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	59
Ancho interorbital:	25
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	190	190
Radio	-998	205
Ulna	-998	209
Carpomet	100	102

AVE

Medidas de la vertebra

Atlas:	4	1a Tor	15.7
Axis:	10.9	2a Tor	13.4
3a Cerv:	-998	3a Tor	14.7
4a Cerv:	16.1	4a Tor	
5a Cerv:	16.6	1a Lum	15.3
6a Cerv:	16.8	2a Lum	15.1
7a Cerv:	16.3	3a Lum	
8a Cerv:	14.9	4a Lum	
9a Cerv:	14.1	5a Lum	
10a Cerv:	13	1a Cocc	8.1
11a Cerv:	12	2a Cocc	6.4
12a Cerv:	12.2	3a Cocc	7.8
		4a Cocc	7.7
		5a Cocc	8.3
		Pigost	0

Fusion de vert

Falange 1	36	36
Falange 2	34	34
Digito 3	15	-998
Polex	27	27

Elementos anatomicos posteriores

Femur	127	126
Tibiotarso	-998	159
Fibula	0	0
Tarsomet	98	99
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	37.4	37.6							38.9	38
II	9.1	9	29	29.2					-998	34.5
III	26	26	11.8	11.6	25	25			-998	26.1
IV	13.2	13.3	6.2	6.2	5	5.5	-998	17.7	-998	19.9

AVE

No de Elemento:	2214, 1919	Entierro:	E.6	Class:	Aves	Age:	Adult
Specnumber:	4	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	Male
Tipo de Material:	6	Asociacion:	N1-31	Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.3	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: Habia dos bolsas de Elemento 1919 pero se pudo pegar estos fragmentos con huesos de Elemento 2214, la cual indica que fue del mismo indivdiuo aunque se levanto como dos elementos. Se scao fragmento de tarsometatarso izquierdo (parte distal) y fragmento de humero izquierdo (parte proximal) para analisis quimico. Habia un fragmento de posible madera que se mando a laboratorio de Paleobotanica con la Dra. McClung.

Modificaciones del superficie

Mod presente? False

Ubicacion

de huellas

de patologias:

Ubicacion

modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Si

Notas:

Que tipo: Reconos 110+220, Resistol 850

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	43.6
Ancho interorbital:	0
Longitud mand:	82.4

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	-998
Radio	-998	-998
Ulna	-998	-998
Carpomet	95.7	-998

AVE

Medidas de la vertebra

Atlas:	4.6	1a Tor	
Axis:	8.8	2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	32.3	-998
Falange 2	0	30.7
Digito 3		-998
Polex	24.3	0

Elementos anatomicos posteriores

Femur	-998	-998
Tibiotarso	156.6	156.6
Fibula	117.6	120
Tarsomet	100.4	100.3
TM Prox W	21	20.95

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	0	35.5								35.6
II	7.3	7.4	27.6	27.6					33	32.9
III	24.8	24.9	9.9	0	22.8	22.9			24.8	24.7
IV	10.8	10.8	5.4	5.5	4.7	4.7	16.4	16.4	18.4	18.5

AVE

No de Elemento:	2226	Entierro:	E.6	Class:	Aves	Age:	Adult
Specnumber:	6	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	Female
Tipo de Material:	6	Asociacion:	N4-C34	Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.6	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: Esta en muy mala estado de conservacion. Hay material organica adherido al hueso en el tibiotarso izquierda y fibula izquierda (ver fotos de acercamiento). Se tomo un tarsometatarso derecho y un fragmento de humero parte distal para analisis quimico.

Modificaciones del superficie

Mod presente? True

Ubicacion

\# de huellas

\# de patologias: 1

Ubicacion: Femur derecho

\# modificaciones:

Ubicacion:

Notas modificaciones: En el femur derecho se observa una textura distincto en la diafisis del femur que pueda representar un tipo de patologia causado por infeccion (ver fotos) aunque tambien puede ser por proceso tafonomico. Material organica en tibiotarso izq y fibula izq.

Consolidantes

Uso consolidante?: Si

Notas:

Que tipo: Reconos 110+220, Resistol 850

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	-998
Ancho interorbital:	-998
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	0	0
Radio	0	0
Ulna	0	0
Carpomet	0	0

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	0	0
Falange 2	0	0
Digito 3	0	0
Polex	0	0

Elementos anatomicos posteriores

Femur	-998	-998
Tibiotarso	-154	-154.2
Fibula	-104.6	-998
Tarsomet	-998	99.5
TM Prox W		23.6

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	37.3	38.1							38.3	-35.1
II	13.5	11.8	29.9	32.7					-998	-34.2
III	26.5	26.3	11.7	12.3	25.9	27.6			27.3	23.4
IV	11.6	13.2	6.4	6.9	5.4	6.8	19.8	18.9	19.3	20.9

AVE

No de Elemento:	2246	Entierro:	E.6	Class:	Aves	Age:	Adult
Specnumber:	7	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	-998
Tipo de Material:	6	Asociacion:	N1-35	Familia:	Accipitridae	Body part	Complete
No de Catalogo:	PPL.Ba.O.7	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: A nivel del tarsomtatarso de los dos lados tiene patologias. Tambien el humero izquierda parte distal tiene patologias. Varias huesos tenian fibras adherido al hueso (carpometacarpo x2, quilla, vertebras, femur izq, tibiotarso izq, mandibula) y varias presentan huellas de corte (femur x2, tibiotarso izquierdo, craneo). Hay patas adicionales mezclado en esta elemento, la cual pasamos a Elemento 2261. Tambien hay un falange de mamifero, quizas de felino que esta mezclado con esta material.

Modificaciones del superficie

Mod presente? True

de huellas: 33

Ubicacion: Femur derecho parte distal, femur izquierdo varias regiones,

de patologias: 3

Ubicacion: Tarsometatarso ambas lados diafisis medial, humero dere

modificaciones: 1

Ubicacion: posible perfolacion tibiotarso izquierdo parte proximal

Notas modificaciones: En los dos lados de tarsometatarso so observa patologias en la parte media, posiblemente por estar atado por tiempo prolongado. Huellas de cortes son muy finas y no profundos. Tibiotarso izq con circulo chico en la parte proximal que pueda ser cultural.

Consolidantes

Uso consolidante?: Si

Que tipo: Reconos 110, B-72

Notas:

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	-998
Ancho interorbital:	-998
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	-178.2
Radio	125.8	-998
Ulna	-998	201.8
Carpomet	-998	94.5

AVE

Medidas de la vertebra

Atlas:	4.4	1a Tor	
Axis:	-998	2a Tor	
3a Cerv:	9	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	-998	33.7
Falange 2	30.9	-998
Digito 3	0	14.6
Polex	-998	26

Elementos anatomicos posteriores

Femur	117.2	117.8
Tibiotarso	157.6	157.3
Fibula	-998	120.4
Tarsomet	98.4	98.8
TM Prox W	-998	22

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	34.1	34.7							37.2	-998
II	7.6	8.1	27.9	27.7					32.7	32.6
III	23.9	23.6	11.4	10.1	22.8	24.4			24.5	22.4
IV	11.5	10.2	5.5	5.6	5.5	5.6	18.2	17.7	18.7	19.2

AVE

No de Elemento:	2070	Entierro:	E.6	Class:	Aves	Age:	Adult
Specnumber:	8	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	-998
Tipo de Material:	6	Asociacion:		Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.8	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: Las medidas del crane se tomo en el bloque de suelo con que se tomo el elemento. Hay patologias en la ala izquierda del individuo.

Modificaciones del superficie

Mod presente? True

Ubicacion:

\# de huellas:

\# de patologias: 3

Ubicacion: humero, radio y ulna izquierda

\# modificaciones:

Ubicacion:

Notas modificaciones: diafisis proximal en radio y ulna y diafisis distal de humero hay deformacion de hueso que al principio pensamos que es proceso tafonomico (casi como si fuera un spiral fracture) pero al fin pensamos que pueda ser una enfermedad.

Consolidantes

Uso consolidante?: Si

Que tipo: Reconos 110, B-72

Notas:

Medidas del craneo

Long max craneal:	112.9
Ancho neurocraneo:	32.3
Ancho interorbital:	11.6
Longitud mand:	83.8

Elementos anatomicos toraxicos

	Izq	Der
Humero	174	173
Radio	193.8	-998
Ulna	-998	205.5
Carpomet	-998	-998

AVE

Medidas de la vertebra

Atlas:	5.3	1a Tor	12.2
Axis:	9.7	2a Tor	14
3a Cerv:	8.8	3a Tor	14
4a Cerv:	11.5	4a Tor	14.2
5a Cerv:	14.3	1a Lum	13.6
6a Cerv:	14.8	2a Lum	
7a Cerv:	15.1	3a Lum	
8a Cerv:	14.8	4a Lum	
9a Cerv:	14.6	5a Lum	
10a Cerv:	14	1a Cocc	6
11a Cerv:	12.5	2a Cocc	8.2
12a Cerv:	10.9	3a Cocc	7.3
		4a Cocc	7.1
		5a Cocc	8.3
		Pigost	-998

Fusion de vert:

Falange 1	31.1	-998
Falange 2	29.6	30
Digito 3	13.9	14.1
Polex	25	0

Elementos anatomicos posteriores

Femur	121.8	121.9
Tibiotarso	154.6	154.6
Fibula	118.7	-998
Tarsomet	96.4	96.4
TM Prox W	21.7	21.7

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	33	33.2							36.4	36.7
II	7.9	8.1	24.3	24.4					33.1	33.3
III	23.6	23.7	9.4	9.5	22	22.1			25	25.1
IV	10.7	10.8	5.5	5.8	4.8	4.9	16.2	16.2	0	19.4

AVE

No de Elemento:	2225.1	Entierro:	E.6	Class:	Aves	Age:	Adult
Specnumber:	9	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	-998
Tipo de Material:	6	Asociacion:	N3-34	Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.9	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: Esta ejemplar esta en muy mala estado de conservacion. Esta mezclado varias garras de mamifero (canido) que puede ser de Ele 2224 o 2221 que asignamos como Ele 2225.2.

Modificaciones del superficie

Mod presente? False

Ubicacion

de huellas

de patologias:

Ubicacion

modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Si

Notas:

Que tipo: Reconos 110, B-72

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	0
Ancho interorbital:	0
Longitud mand:	0

Elementos anatomicos toraxicos

	Izq	Der
Humero	0	0
Radio	0	0
Ulna	0	0
Carpomet	0	0

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	0	0
Falange 2	0	0
Digito 3	0	0
Polex	0	0

Elementos anatomicos posteriores

Femur	0	0
Tibiotarso	0	0
Fibula	0	0
Tarsomet	0	0
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	0	37.4								36.8
II	0		-998	0					30.8	
III	25	0	11.5	0	25.7	0			24.3	
IV	-998	0	6.7	0	6.1	0	20	0		17.1

AVE

No de Elemento:	2192	Entierro:	E.6	Class:	Aves	Age:	-998
Specnumber:	11	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	-998
Tipo de Material:	6	Asociacion:		Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.11	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: Elementos anatomicas presentes aunque muy fragmentados, sobre todo los humeros de las cuales no se tienen medias. Hay una muestra de suelo y un fragmento de aglomerado de gravilla, y talvez estaban comprimidas y con posible copal.

Modificaciones del superficie

Mod presente? False

Ubicacion

de huellas

de patologias:

Ubicacion

modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Si

Notas:

Que tipo: Reconos 110+220, Resistol 850

Medidas del craneo

Long max craneal:	122.7
Ancho neurocraneo:	47.4
Ancho interorbital:	27.8
Longitud mand:	93.6

Elementos anatomicos toraxicos

	Izq	Der
Humero	0	0
Radio	0	0
Ulna	0	221.4
Carpomet	103.3	0

AVE

Medidas de la vertebra

Atlas:	5.7	1a Tor	-998
Axis:	10.7	2a Tor	-998
3a Cerv:	11.4	3a Tor	-998
4a Cerv:	14.5	4a Tor	-998
5a Cerv:	18.2	1a Lum	21.9
6a Cerv:	15.6	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	17.1	4a Lum	
9a Cerv:	18.6	5a Lum	
10a Cerv:	19.2	1a Cocc	
11a Cerv:	18.7	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	41.2

Fusion de vert

Falange 1	0	0
Falange 2	0	0
Digito 3	0	0
Polex	0	0

Elementos anatomicos posteriores

Femur	131.6	131.7
Tibiotarso	172.9	172.9
Fibula		131.2
Tarsomet	102.4	102.4
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	30.6	30.7							49.5	49.6
II	25.1	25.1	38.1	39.4					43.7	44
III	24.6	24.75	11.3	11.72	26.5	26.6			29.1	29.4
IV	10.8	11	5.9	6	6.5	6.6	20.7	20.8	24.1	24.7

AVE

No de Elemento:	2261	Entierro:	E.6	Class:	Aves	Age:	-998
Specnumber:	12	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	-998
Tipo de Material:	6	Asociacion:	N2-35	Familia:	Accipitridae	Body part	Various
No de Catalogo:	PPL.Ba.O.12	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: Incluye unos elementos (falanges y garras) de individuo 2246.

Modificaciones del superficie

Mod presente?	False	Ubicacion	
# de huellas			
# de patologias:			
Ubicacion			
# modificaciones:			
Ubicacion:			

Notas modificaciones:

Consolidantes

Uso consolidante?:	Si	Notas:	
Que tipo	Reconos 110+220, Resistol 850		

Medidas del craneo

Long max craneal:	
Ancho neurocraneo:	0
Ancho interorbital:	0
Longitud mand:	0

Elementos anatomicos toraxicos

	Izq	Der
Humero	0	0
Radio	0	0
Ulna	-211.2	0
Carpomet	0	0

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	0	0
Falange 2	0	0
Digito 3	0	0
Polex	0	0

Elementos anatomicos posteriores

Femur	0	0
Tibiotarso	0	0
Fibula	0	0
Tarsomet	0	0
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	36.9	0							40.3	41.1
II	-998	-998	30	0					35.4	35.5
III	26.3	0	11.1	-998	25.3	-998			28.2	
IV	12.3	11.2	6.3	6.5	6.5	-998	19.2	19.7	-998	19.6

AVE

No de Elemento:	283.1	Entierro:	E.2	Class:	Aves	Age:	Infant/juvenile
Specnumber:	54	Localidad:	T.2, E.2	Orden:	Accipitriformes	Sex:	Poss. Male
Tipo de Material:	6	Asociacion:		Familia:	Accipitridae	Body part	Complete
No de Catalogo:	PPL.Ba.O.54	Capa:	LXXI	Genus:	Aquila		
No de Bolsa:		Elevation:		Specie:	chrysaetos		

Notes: Individuo completo aunque fragmentado. Sin ningun modificacion del superficie. Posiblemente se trata de una hembra por la morfologia del tarsometatarso.

Modificaciones del superficie

Mod presente? False

Ubicacion:

\# de huellas:

\# de patologias:

Ubicacion:

\# modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Si

Que tipo: Other UnID

Notas: Posiblemente resistol deluido

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	-998
Ancho interorbital:	-998
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	-998
Radio	-998	-999
Ulna	-999	-998
Carpomet	-999	-999

AVE

Medidas de la vertebra

Atlas:	3.6	1a Tor	
Axis:	9	2a Tor	
3a Cerv:	9.4	3a Tor	
4a Cerv:	12.1	4a Tor	12.7
5a Cerv:	12.6	1a Lum	11.1
6a Cerv:	14	2a Lum	14.4
7a Cerv:	16.6	3a Lum	15
8a Cerv:	16.7	4a Lum	14.5
9a Cerv:	15.2	5a Lum	15.2
10a Cerv:	12.7	1a Cocc	8.2
11a Cerv:	16.4	2a Cocc	8.4
12a Cerv:	11.7	3a Cocc	7.7
		4a Cocc	8.3
		5a Cocc	7.1
		Pigost	8.9

Fusion de vert:

Falange 1	-999	-998
Falange 2	-999	-998
Digito 3	-999	-999
Polex	-999	-999

Elementos anatomicos posteriores

Femur	119.9	-998
Tibiotarso	-999	-999
Fibula	-998	-998
Tarsomet	87.6	-998
TM Prox W	23.01	-998

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	-998	39.1							-999	39.8
II	9.9	8.8	31	31.3					-998	33.7
III	25.9	-998	11.5	11.4	26.9	26.2			25.8	25.8
IV	13	12.8	6.3	-999	5.7	-999	20	20.2	-999	-998

AVE

No de Elemento:	309.1	Entierro:	E.2	Class:	Aves	Age:	Adult
Specnumber:	55	Localidad:	T.2, E.2	Orden:	Accipitriformes	Sex:	Female
Tipo de Material:	6	Asociacion:	Sec.F, Skel 1	Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.55	Capa:	LXXI	Genus:	Aquila		
No de Bolsa:	A-3606	Elevation:		Specie:	chrysaetos		

Notes: Individuo casi completo sin modificaciones del superficie. Posiblemente se trata de una hembra por la morfologia de tarsometatarso.

Modificaciones del superficie

Mod presente? False

Ubicacion

\# de huellas

\# de patologias:

Ubicacion

\# modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Si

Que tipo: Other UnID

Notas: Posiblemente resistol deluido

Medidas del craneo

Long max craneal:	-103
Ancho neurocraneo:	-998
Ancho interorbital:	25
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	188	189
Radio	101	103
Ulna	208	-998
Carpomet	96.9	96.4

AVE

Medidas de la vertebra

Atlas:	4.3	1a Tor	11.2
Axis:	11.4	2a Tor	11.5
3a Cerv:	10.5	3a Tor	11.8
4a Cerv:	11.6	4a Tor	
5a Cerv:	15.1	1a Lum	14.3
6a Cerv:	13.2	2a Lum	15.1
7a Cerv:	13.2	3a Lum	13.8
8a Cerv:	16	4a Lum	14.5
9a Cerv:	14.6	5a Lum	11.2
10a Cerv:	15.4	1a Cocc	7.9
11a Cerv:	16.3	2a Cocc	6.6
12a Cerv:	16.5	3a Cocc	8.5
		4a Cocc	9.8
		5a Cocc	8
		Pigost	9.5

Fusion de vert

Falange 1	38.6	37.6
Falange 2	32.7	32.6
Digito 3	-999	27.2
Polex	18.1	17.9

Elementos anatomicos posteriores

Femur	-998	123.5
Tibiotarso	-998	161
Fibula	-998	123
Tarsomet	98.5	100
TM Prox W	23.5	23.6

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	37.4	37.5							37.5	38.2
II	8.3	8	29.7	29.3					33.6	34.3
III	27.2	27.1	11.3	11.2	24.8	24.6			25.5	25.4
IV	13.6	13.1	5.9	6	5.3	5.3	18.5	18.6	20.7	20.4

AVE

No de Elemento:	81.1	Entierro:	E.2	Class:	Aves	Age:	Poss juv.
Specnumber:	57	Localidad:	T.2, E.2	Orden:	Accipitriformes	Sex:	-998
Tipo de Material:	6	Asociacion:	E.2.1	Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.57	Capa:	LXXI	Genus:	Aquila		
No de Bolsa:		Elevation:		Specie:	chrysaetos		

Notes: Aguila completo aunque muy fragmentado. Existe una patologia en la diafisis de tibiotarso derecho, posiblemente por una fractura, pero la remodelacion del hueso suguiere que sobrevivio esta herida. Tambien se incluyo restos de un conejo como parte de contenido estomacal (El. 81.2) y unos fragmentos de ave (El. 81.3). La aguila es un poco chico comparando con El.309, por lo tanto se pueda ser de un individuo joven, o un macho, pero por la fragmentacion del tarsometatarso no se pudo identificar la edad.

Modificaciones del superficie

Mod presente? True

Ubicacion

de huellas

de patologias: 1

Ubicacion: tibiotarso derecha

modificaciones:

Ubicacion:

Notas modificaciones: Patologia en diafisis derecha

Consolidantes

Uso consolidante?: Si

Notas: Posiblemente resistol deluido

Que tipo: Other UnID

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	-998
Ancho interorbital:	-998
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	-998
Radio	-998	97
Ulna	-998	-200
Carpomet	-999	-998

AVE

Medidas de la vertebra

Atlas:	3.4	1a Tor	14.8
Axis:	-998	2a Tor	14.8
3a Cerv:	-999	3a Tor	13.9
4a Cerv:	10.3	4a Tor	14
5a Cerv:	7.9	1a Lum	12
6a Cerv:	10.6	2a Lum	
7a Cerv:	13.8	3a Lum	
8a Cerv:	12.5	4a Lum	
9a Cerv:	13.4	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	33.3	32.7
Falange 2	-998	-999
Digito 3	23.9	-22.8
Polex	-999	-999

Elementos anatomicos posteriores

Femur	126.1	-998
Tibiotarso	-998	-998
Fibula	-998	-998
Tarsomet	-998	-998
TM Prox W	-998	-998

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	-998	37.3							-998	-999
II	-7.1	7.1	28.4	-998					-998	-998
III	24.7	-998	10.5	10.4	-998	-998			-998	-999
IV	11.8	-998	5.4	-999	5.3	5.3	19.2	-998	-998	-999

AVE

No de Elemento:	121	Entierro:	E.2	Class:	Aves	Age:	Poss juv.
Specnumber:	61	Localidad:	T.2, E.2	Orden:	Accipitriformes	Sex:	Male
Tipo de Material:	6	Asociacion:	E.2.3, Sec.A	Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.61	Capa:	LXXI, LXXVI	Genus:	Aquila		
No de Bolsa:		Elevation:		Specie:	chrysaetos		

Notes: Individuo mas chico en tamano comparado con El.309, puede ser que se trata de un macho (el tarsometatarso es mas delgado) y/o que se trata de un individuo juvenile que todavia no ha alcanzado a llegar a su estatura completa. Desafortunadamente es un ejempar muy mal preservado aunque se trata de un individuo completo. Varios frag se presenta una coloracion café y tiende ser muy britales, pero probablemente sea resultado de algun proceso tafonomico, no por ser quemado. Patologia en el digito 3 en la parte distal, un poco de mal formacion, quizas por una herida en este deigito pero sin ningun otro dato mas.

Modificaciones del superficie

Mod presente? True

Ubicacion

\# de huellas

\# de patologias: 3

Ubicacion: ulna, digito 3, dedo 3

\# modificaciones:

Ubicacion:

Notas modificaciones: Patologia en la ulna derecha en la diafisis proximal, digito 3 derecha de la ala y dedo III, falange 3 de lado izquierda en la pata. Todos parecen ser liping, un aceso de hueso pero es dificil saber la causa de la patologia.

Consolidantes

Uso consolidante?: Si

Notas: Posiblemente resistol deluido

Que tipo: Other UnID

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	-998
Ancho interorbital:	-998
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	-998
Radio	196	-999
Ulna	-999	-998
Carpomet	-998	-998

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	13.6	4a Tor	
5a Cerv:	10	1a Lum	13.5
6a Cerv:	-998	2a Lum	14
7a Cerv:	10	3a Lum	14.1
8a Cerv:	0	4a Lum	13.4
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	7.6
11a Cerv:	0	2a Cocc	8.1
12a Cerv:	0	3a Cocc	7.5
		4a Cocc	7.2
		5a Cocc	7
		Pigost	8.1

Fusion de vert

Falange 1	-999	33.1
Falange 2	-999	-998
Digito 3	-999	22
Polex	-998	15

Elementos anatomicos posteriores

Femur	-998	-998
Tibiotarso	-156	-163
Fibula	-998	115
Tarsomet	98	98
TM Prox W	20.8	21.2

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	37.8	35.1							35.7	-999
II	7.6	7.5	27.3	27					32.2	31.6
III	24.8	24.9	11	10.6	22.5	22.2			-999	-999
IV	12.7	12.6	5.6	5.7	5.1	5.5	16.9	17	18.7	-999

AVE

No de Elemento:	165.1	Entierro:	E.2	Class:	Aves	Age:	Poss. Yng adult
Specnumber:	62	Localidad:	T.2, E.2	Orden:	Accipitriformes	Sex:	Female
Tipo de Material:	6	Asociacion:	E.2.8, 7.5m	Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.62	Capa:	LXXI	Genus:	Aquila		
No de Bolsa:		Elevation:		Specie:	chrysaetos		

Notes: Individuo completo aunque unos elementos estan fragmentados. Sin ningun modificacion del superficie. Mezclado hubo un inominato derecha de un mamifero chico (El 165.2). Edad por la fenestra en la septum interorbital del craneo.

Modificaciones del superficie

Mod presente? False

Ubicacion

de huellas

de patologias:

Ubicacion

modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Si

Que tipo: Other UnID

Notas: Posiblemente resistol deluido

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	65
Ancho interorbital:	22
Longitud mand:	85.4

Elementos anatomicos toraxicos

	Izq	Der
Humero	-190	-998
Radio	-998	-202
Ulna	-213	213
Carpomet	-998	-998

AVE

Medidas de la vertebra

Atlas:	3.9	1a Tor	15.2
Axis:	10.1	2a Tor	14.4
3a Cerv:	11.8	3a Tor	15
4a Cerv:	13.8	4a Tor	14.3
5a Cerv:	16.2	1a Lum	12
6a Cerv:	15.8	2a Lum	13.4
7a Cerv:	16.6	3a Lum	11.6
8a Cerv:	17	4a Lum	
9a Cerv:	17.3	5a Lum	
10a Cerv:	0	1a Cocc	7.6
11a Cerv:	0	2a Cocc	7.6
12a Cerv:	0	3a Cocc	8.1
		4a Cocc	8.1
		5a Cocc	7.5
		Pigost	12.5

Fusion de vert

Falange 1	37.9	37.8
Falange 2	-998	-998
Digito 3	29	27
Polex	-999	16.7

Elementos anatomicos posteriores

Femur	125.6	125.3
Tibiotarso	-998	-998
Fibula	-998	-998
Tarsomet	100.5	-998
TM Prox W	-998	-998

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	40.3	40							37.4	39.8
II	8.5	8.5	31.6	31.2					-998	-998
III	27.9	27.8	11.7	11.6	-999	26.5			-999	-999
IV	14.4	14.2	-999	6.5	-999	5.7	-999	19.8	-999	19.3

AVE

No de Elemento:	126.1	Entierro:	E.2	Class:	Aves	Age:	-998
Specnumber:	64	Localidad:	T.2, E.2	Orden:	Passeriformes	Sex:	-998
Tipo de Material:	6	Asociacion:	E.2.4, Sec.A	Familia:	Corvidae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.64	Capa:	LXXI	Genus:	Corvus		
No de Bolsa:	A-1755	Elevation:		Specie:	corax		

Notes: Individuo semi-completo, como en caso de 126.2 y 126.3, no se puede saber si fue un individuo completo, quizas segundario. En este caja se levanto como elemento 126 pero por lo menos 5 individuos y por la fragmentacion, no se puedo reconstruir todos los elementos y identificar a cual individuo corresponda. Ademas de los 5 individuos que se pudo separar, hubo muchas huesos que solo se pudo identificar el elemento y no a nivel especie que se dibujo en una esquema aparte.

Modificaciones del superficie

Mod presente? False

Ubicacion

de huellas

de patologias:

Ubicacion

modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Quizas

Que tipo: -998

Notas: No se sabe si uso consolidante, pero puede ser que aplicaron resistol deluido.

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	-998
Ancho interorbital:	-998
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	-999
Radio	-999	-998
Ulna	-998	-998
Carpomet	62.5	62.7

AVE

Medidas de la vertebra

Atlas:	-999	1a Tor	
Axis:	9.9	2a Tor	
3a Cerv:	11.6	3a Tor	
4a Cerv:	11.9	4a Tor	
5a Cerv:	12.8	1a Lum	
6a Cerv:	13	2a Lum	
7a Cerv:	-998	3a Lum	
8a Cerv:	-998	4a Lum	
9a Cerv:	11.1	5a Lum	
10a Cerv:	0	1a Cocc	5.3
11a Cerv:	0	2a Cocc	5.3
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	30.8	-998
Falange 2	-999	-999
Digito 3	-998	-999
Polex	-999	-999

Elementos anatomicos posteriores

Femur	-999	-999
Tibiotarso	-999	-999
Fibula	-999	-999
Tarsomet	-999	-999
TM Prox W	-999	-999

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	-999	-999							-999	-999
II	9.9	10.1	21.7	20.5					-999	-999
III	20.7	22	17.7	17.8	17.6	17.6			-999	-999
IV	8.7	9.9	12.2	11.2	3.9	3.8	5.7	5.7	-999	-999

AVE

No de Elemento:	126.2	Entierro:	E.2	Class:	Aves	Age:	-998
Specnumber:	65	Localidad:	T.2, E.2	Orden:	Falconiformes	Sex:	-998
Tipo de Material:	6	Asociacion:	E.2.4, Sec.A	Familia:	Falconidae	Body part	Head and extremities
No de Catalogo:	PPL.Ba.O.65	Capa:	LXXI	Genus:	Falco		
No de Bolsa:	A-1755	Elevation:		Specie:	F. mexicanus		

Notes: Individuo semi-completo, como 126.1 y 126.3 no es seguro si fue un individuo completo pero varios elementos presentes. Hubo muchos fragmentos de vertebra entre los materiales pero no se pudo asignar a cual individuo correspondia.

Modificaciones del superficie

Mod presente? False

Ubicacion

de huellas

de patologias:

Ubicacion

modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Quizas

Que tipo: -998

Notas: No se sabe si uso consolidante, pero puede ser que aplicaron resistol deluido.

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	0
Ancho interorbital:	14.5
Longitud mand:	0

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	0
Radio	-998	-998
Ulna	0	0
Carpomet	-998	0

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	4.9	4a Tor	
5a Cerv:	6.1	1a Lum	
6a Cerv:	7.1	2a Lum	
7a Cerv:	6.9	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	0	0
Falange 2	20	0
Digito 3	-16	0
Polex	0	0

Elementos anatomicos posteriores

Femur	0	0
Tibiotarso	-998	-998
Fibula	-998	0
Tarsomet	52.1	51.9
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	16.8	16.9								
II	10.2	10.2	15.7	15.6						
III	17.5	17.8	11.4	11.3	14	14				
IV	5.9	6	5.1	5	6.5	6.4	13.4	13.4		0

AVE

No de Elemento:	126.3	Entierro:	E.2	Class:	Aves	Age:	-998
Specnumber:	66	Localidad:	T.2, E.2	Orden:	Strigiformes	Sex:	-998
Tipo de Material:	6	Asociacion:	E.2.4, Sec.A	Familia:	Strigidae	Body part	Various
No de Catalogo:	PPL.Ba.O.66	Capa:	LXXI	Genus:	Bubo		
No de Bolsa:	A-1755	Elevation:		Specie:	virginianus		

Notes: Individuo semi-completo aunque falta muchos elementos se observa la presencia de los extremidades, la parte axial y pocas fragmentos de craneo. Dificil decir si fue individuo completo porque varios individuos fueron mezclado en una bolsa y son muy fragmentados. Sin modificaciones de superficie.

Modificaciones del superficie

Mod presente?	False	Ubicacion	
# de huellas			
# de patologias:			
Ubicacion			
# modificaciones:			
Ubicacion:			

Notas modificaciones:

Consolidantes

Uso consolidante?:	Quizas	Notas:	No se sabe si uso consolidante, pero puede ser que aplicaron resistol deluido.
Que tipo	-998		

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	-998
Ancho interorbital:	-998
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	0	0
Radio	-998	-998
Ulna	-998	0
Carpomet	60	0

AVE

Medidas de la vertebra

Atlas:	-998	1a Tor	
Axis:	-998	2a Tor	
3a Cerv:	9.4	3a Tor	
4a Cerv:	9.05	4a Tor	
5a Cerv:	9.6	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	13	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	4.8
11a Cerv:	0	2a Cocc	4.9
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	18.6	0
Falange 2	15.4	0
Digito 3	20.1	0
Polex	0	0

Elementos anatomicos posteriores

Femur	0	0
Tibiotarso	0	0
Fibula	0	-998
Tarsomet	58.9	61.1
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	0	0							0	0
II	4.7	4.5	26.1	-998					0	0
III	14.1	13.9	13.3	13.5	14.8	15.4			0	0
IV	0	9.04	8.3	0	0	8.7	8	0	0	0

AVE

No de Elemento:	2069.1	Entierro:	E.6	Class:	Aves	Age:	Adult
Specnumber:	15	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	Male
Tipo de Material:	6	Asociacion:	N3-32-33	Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.15	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: Por las partes anatomicas que unicamente se han hallado pareciera ser resultado de la elaboracion de una piel, ademas, posiblemente se cubrio de un pigmento rojo por lo pocos residuos encontrados en los huesos.

Modificaciones del superficie

Mod presente? True

Ubicacion

\# de huellas

\# de patologias: 1

Ubicacion: Tarsometatarso derecha

\# modificaciones:

Ubicacion:

Notas modificaciones: Patologia en el tarsometatarso derecha lado medial.

Consolidantes

Uso consolidante?: Si

Notas:

Que tipo: Reconos 110+220, Resistol 850

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	0
Ancho interorbital:	0
Longitud mand:	81.1

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	184
Radio	-998	206
Ulna	-188	-998
Carpomet	-998	97.3

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	34.3	34.9
Falange 2	26.7	-998
Digito 3	15.8	15.2
Polex	31.7	31.4

Elementos anatomicos posteriores

Femur	-998	-998
Tibiotarso	16.5	-998
Fibula	123	-998
Tarsomet	100	99
TM Prox W	-998	21.33

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	24.8	24.6							42.5	42.6
II	24.5	25	0	0					37	37.1
III	23.8	24.4	9.2	9.3	22.9	23			28.1	28.2
IV	10.9	11	5.4	5.6	4.6	4.5	17	17	21.7	21.3

AVE

No de Elemento:	2193	Entierro:	E.6	Class:	Aves	Age:	-998
Specnumber:	17	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	Male
Tipo de Material:	6	Asociacion:		Familia:	Accipitridae	Body part	Head and extremities
No de Catalogo:	PPL.Ba.O.17	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	K-1300	Elevation:		Specie:	chrysaetos		

Notes: Las muestras quimicas del ave fueron tomadas del tarsometatarso izquierdo y un fragmento de la parte distal de la ulna derecha. El esqueleto que se encontro es posible que se trata de un organismo modificado para el aprovechamiento de la piel.

Modificaciones del superficie

Mod presente?	True	Ubicacion	Craneo, mandibula, radio derecha
# de huellas	3		
# de patologias:			
Ubicacion			
# modificaciones:			
Ubicacion:			

Notas modificaciones: se presenta huellas en la parte occipital del craneo, en la mandibula izquierda, y la diafisis proximal del radio. Por la ausencia de varias elementos y estos modificaciones, es probable que este individuo fue preparado taxidermicamente.

Consolidantes

Uso consolidante?:	Si	Notas:	
Que tipo	Reconos 110+220, Resistol 850		

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	0
Ancho interorbital:	47.8
Longitud mand:	84.4

Elementos anatomicos toraxicos

	Izq	Der
Humero	0	0
Radio	200	200
Ulna	212	210
Carpomet	99	96.8

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	35.5	36
Falange 2	25.9	26.1
Digito 3	0	15.9
Polex	30.8	31.1

Elementos anatomicos posteriores

Femur	0	0
Tibiotarso	0	0
Fibula	0	0
Tarsomet	101.9	102.9
TM Prox W		21.07

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	0	36.5							37.7	37.1
II	7.7	8	27.8	27.7					33.8	34.9
III	25.1	25	10.6	10.5	24	24.1			26.6	26.2
IV	12.2	12	5.6	5.6	5.4	5.8	19.1	18.7	20.6	20.4

AVE

No de Elemento:	191	Entierro:	E.2	Class:	Aves	Age:	Adult
Specnumber:	52	Localidad:	T.2, E.2	Orden:	Accipitriformes	Sex:	-998
Tipo de Material:	6	Asociacion:		Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.52	Capa:	LXXI	Genus:	Aquila		
No de Bolsa:		Elevation:		Specie:	chrysaetos		

Notes: No esta conservado el lado izq de tarsometatarso y el lado derecha es incompleto para poder verificar el sexo del individuo. Tenemos que ver los datos de medida para eso. En ambos ulnas en el parte distal se observa una patologia que suguiere malnutricion. Hay unas modificaciones en el superficie del tibiotarso derecha distal que necesitan verificar bajo microsocopio.

Modificaciones del superficie

Mod presente?: True

Ubicacion:

de huellas:

de patologias: 2

Ubicacion: Ulna en parte distal

modificaciones:

Ubicacion:

Notas modificaciones: Patología en ambas ulnas en parte distal, posiblemente osteoporosis por malnutricion.

Consolidantes

Uso consolidante?: Si

Que tipo: Other UnID

Notas: Posiblemente resistol deluido

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	-998
Ancho interorbital:	-998
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	-998
Radio	204	204.5
Ulna	216.7	214.6
Carpomet	102.6	-998

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	-998	3a Tor	
4a Cerv:	-998	4a Tor	
5a Cerv:	14.7	1a Lum	
6a Cerv:	-998	2a Lum	
7a Cerv:	-11.7	3a Lum	
8a Cerv:	13.8	4a Lum	
9a Cerv:	-998	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	-998

Fusion de vert:

Falange 1	42.3	42.1
Falange 2	-998	36.7
Digito 3	25.7	27
Polex	14.3	0

Elementos anatomicos posteriores

Femur	126	-998
Tibiotarso	-998	-998
Fibula	-998	-998
Tarsomet	-999	-998
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	-998	-998							-998	-43
II	-998	-999	-999	31					-998	-998
III	-998	-999	11.6	-999	-998	-998			23.3	-999
IV	13.7	-999	6.1	7.3	5.4	5.3	19.1	18.9	18.5	19.2

AVE

No de Elemento:	196	Entierro:	E.2	Class:	Aves	Age:	Adult
Specnumber:	53	Localidad:	T.2, E.2	Orden:	Accipitriformes	Sex:	Female
Tipo de Material:	6	Asociacion:		Familia:	Accipitridae	Body part	Complete
No de Catalogo:	PPL.Ba.O.53	Capa:	LXXI	Genus:	Aquila		
No de Bolsa:		Elevation:		Specie:	chrysaetos		

Notes: Ave muy robusto y grande. Hembra por su tamano y facet metatarsal que es robusto y recto.

Modificaciones del superficie

Mod presente? False

Ubicacion

\# de huellas

\# de patologias:

Ubicacion

\# modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Si

Notas: Posiblemente resistol deluido

Que tipo: Other UnID

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	54.8
Ancho interorbital:	-24.8
Longitud mand:	-89.9

Elementos anatomicos toraxicos

	Izq	Der
Humero	198	197
Radio	212	215
Ulna	-998	-998
Carpomet	107	-998

AVE

Medidas de la vertebra

Atlas:	5.6	1a Tor	
Axis:	-998	2a Tor	
3a Cerv:	14.4	3a Tor	
4a Cerv:	16	4a Tor	
5a Cerv:	16.6	1a Lum	
6a Cerv:	16.7	2a Lum	
7a Cerv:	16.5	3a Lum	
8a Cerv:	12	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	16.8

Fusion de vert

Falange 1	40	40
Falange 2	35	36
Digito 3	29	28
Polex	18	17

Elementos anatomicos posteriores

Femur	134	133
Tibiotarso	173	171
Fibula	133	-998
Tarsomet	105	-106
TM Prox W	25	25

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	40.2	39.3							-47.1	46.4
II	14.3	14.4	6.4	6.3					22	20.5
III	28.6	27.4	28	28.3	19.5	-998			-29.3	-27
IV	-999	15.4	32.6	33.9	-999	-999	-999	-999	-40	41.3

AVE

No de Elemento:	1446.1	Entierro:	E.5	Class:	Aves	Age:	-998
Specnumber:	214	Localidad:	T.8, E.5	Orden:	Falconiformes	Sex:	-998
Tipo de Material:	6	Asociacion:	W3	Familia:	Accipitridae	Body part	Extremities
No de Catalogo:	PPL.Ba.O.21	Capa:	CXV	Genus:	Buteo		
No de Bolsa:		Elevation:		Specie:	sp.		

Notes: Se trata de 3 individuos, dos aves y un falange de felino sin craneo.

Modificaciones del superficie

Mod presente? False

Ubicacion

de huellas

de patologias:

Ubicacion

modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: No

Notas:

Que tipo

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	0
Ancho interorbital:	0
Longitud mand:	0

Elementos anatomicos toraxicos

	Izq	Der
Humero	0	0
Radio	0	0
Ulna	0	0
Carpomet	0	0

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	0	0
Falange 2	0	0
Digito 3	0	0
Polex	0	0

Elementos anatomicos posteriores

Femur	0	0
Tibiotarso	0	0
Fibula	0	0
Tarsomet	0	54.2
TM Prox W		6.8

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	0	0								
II	0		0	11.1						
III	0	0	0	0	0	0				
IV	0	0	0	0	0	0	0	0		0

AVE

No de Elemento:	1888	Entierro:	E.6	Class:	Aves	Age:	-998
Specnumber:	1	Localidad:	T.12, E.6	Orden:	Accipitriformes	Sex:	Female
Tipo de Material:	6	Asociacion:	N3-N4	Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.1	Capa:	LXXXI	Genus:	Aquila		
No de Bolsa:	-999	Elevation:	0	Specie:	chrysaetos		

Notes: Falta el cráneo junto con las vértebras coaxiales, cervicales y lumbares. Tiene patologías en el dedo 1 izquierdo, falange 2 y no presenta la garra. Para muestra de analisis se tomo el tarsometatarso derecho y fragmento del humero izquierdo.

Modificaciones del superficie

Mod presente? True

Ubicacion

\# de huellas

\# de patologias: 1

Ubicacion: Dedo 1 de falange 2 izquierda

\# modificaciones:

Ubicacion:

Notas modificaciones: Patologia posblemente de una fatura por lo cual no hay garra de dedo 1.

Consolidantes

Uso consolidante?: Si

Notas:

Que tipo: Reconos 110, B-72

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	0
Ancho interorbital:	0
Longitud mand:	0

Elementos anatomicos toraxicos

	Izq	Der
Humero	172.1	-998
Radio	-998	187.8
Ulna	199.9	-998
Carpomet	96.9	-998

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	35.5	35.3
Falange 2	25.4	22.6
Digito 3	15.6	-998
Polex	-998	-998

Elementos anatomicos posteriores

Femur	120.3	120.6
Tibiotarso	-998	92.8
Fibula	156.5	0
Tarsomet	0	0
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	34.9	35.1							-998	28.1
II	12.5	13.5	31.2	30.9					31.2	34.2
III	26.9	25.4	10.2	11.4	24.6	25.4			-21.9	17.3
IV	11.6	12	6.2	6.6	5.9	5.9	20	20	18	14.9

AVE

No de Elemento:	PPS155, 310,	Entierro:	O.2	Class:	Aves	Age:	-998
Specnumber:	202	Localidad:	F.C, O.2, T.3	Orden:	Falconiformes	Sex:	-998
Tipo de Material:	6	Asociacion:	P.59	Familia:	Accipitridae	Body part	Head and extremities
No de Catalogo:	PPS.Ba.O.20	Capa:	III y VIII	Genus:	Buteo		
No de Bolsa:		Elevation:		Specie:	jamaicensis		

Notes: Elemento 312 fue encontrado un poco islado de otro elementos auqnue incluy ulna izquierda y tarsometatarso izquierdo pero es de mismo tamano y forma que los huesos de Ele 155 y 310. Esto suguiere que es un entierro secundario. Craneo tiene fractura en parte occipital. Individuo no compelto falta parte axial y hombro. Huellas en ulna y radio. Se tomo polimero para analisis de huella de manefactura. No se uso consolidante solo pego con Paraloid B-72.

Modificaciones del superficie

Mod presente? True

\# de huellas 16

Ubicacion: Ulna, radio y tarsometatarso

\# de patologias:

Ubicacion

\# modificaciones:

Ubicacion:

Notas modificaciones: Fractura en parte occipital, huellas de corte en ulna y radio derecha y tarsometatarso ambas lados. Los de tarsometatarso probablemente fue inflingido a la hora de desarticular el tarsometatarso del tibiotarso en la cara articular proximal de ambas lados. Se tomo un polimero de estas huellas que son mas profundos y anchos que el ejemplar tomado de las huellas de corte en la ulna.

Consolidantes

Uso consolidante?: No

Notas: Pego con B-72.

Que tipo

AVE

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	28.6
Ancho interorbital:	10.7
Longitud mand:	-998

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Elementos anatomicos toraxicos

	Izq	Der
Humero	0	0
Radio	-998	75.7
Ulna	82.3	0
Carpomet	46.4	46.2
Falange 1	15.8	15.3
Falange 2	14.3	14.2
Digito 3	0	0
Polex	0	0

Elementos anatomicos posteriores

Femur	0	0
Tibiotarso	0	0
Fibula	0	0
Tarsomet	68.5	-998
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	19.6	19.3							17.7	18.1
II	5.6	6.3	16.6	16.8					15.3	16.6
III	16.5	17	14.1	14.2	11.6	11.7			10.7	11.1
IV	8	8	9.7	9.4	3.7	3.7	4.1	4.2	8.9	-998

AVE

No de Elemento:	120	Entierro:	E.2	Class:	Aves	Age:	Poss juv.
Specnumber:	56	Localidad:	T.2, E.2	Orden:	Accipitriformes	Sex:	Male
Tipo de Material:	6	Asociacion:	E.2.2	Familia:	Accipitridae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.56	Capa:	LXXI	Genus:	Aquila		
No de Bolsa:	A-1755	Elevation:		Specie:	chrysaetos		

Notes: Individuo completo aunque varias elementos, particularmente la ala izquierda esta totalmente fracturado. El individuo es mas chico que ele 309, pero la proporcion del tarsometatarso es semejante y tiene una faceta al tarso IV pronunciado que parece indicar que se trata de una hembra. Patologia en la diafisis proximal del tibula izquierda, posiblemente se trata de un infecion pero es minimo, probablemente este individuo todavia movia normal. La caja de El 126 tuvo material mezclado con El 120.

Modificaciones del superficie

Mod presente? False

Ubicacion

\# de huellas

\# de patologias:

Ubicacion

\# modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: Si

Notas: Posiblemente resistol deluido

Que tipo: Other UnID

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	61.7
Ancho interorbital:	26
Longitud mand:	84

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	176
Radio	-998	190
Ulna	-998	-998
Carpomet	-998	-998

AVE

Medidas de la vertebra

Atlas:	4.3	1a Tor	13.7
Axis:	9	2a Tor	14.1
3a Cerv:	9.3	3a Tor	14.4
4a Cerv:	-998	4a Tor	14.6
5a Cerv:	10.6	1a Lum	
6a Cerv:	-8.3	2a Lum	
7a Cerv:	11.4	3a Lum	
8a Cerv:	11.7	4a Lum	
9a Cerv:	10.6	5a Lum	
10a Cerv:	14.1	1a Cocc	
11a Cerv:	14.9	2a Cocc	
12a Cerv:	14.6	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	

Fusion de vert

Falange 1	0	32.3
Falange 2	0	0
Digito 3	0	0
Polex	0	0

Elementos anatomicos posteriores

Femur	-998	-998
Tibiotarso	-998	-998
Fibula	113	-998
Tarsomet	95	94.4
TM Prox W	19	20.4

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	33.9	33.9							34.5	32.7
II	7.8	7.6	25.7	25.4					30.8	30.2
III	23.6	23.6	10	9.8	21.3	21.3			22.3	23
IV	11.3	11.6	5.3	5.3	4.5	4.5	16.3	16.5	16.9	17.6

AVE

No de Elemento:	565	Entierro:	E.3	Class:	Aves	Age:	Juvenile
Specnumber:	127	Localidad:	T.2, E.3	Orden:	Falconiformes	Sex:	-998
Tipo de Material:	6	Asociacion:	Animal IV	Familia:	Accipitridae	Body part	Various
No de Catalogo:	PPL.Ba.O.12	Capa:	CCLXIII	Genus:	Buteo		
No de Bolsa:		Elevation:		Specie:	sp.		

Notes: Varias huesos de ve muy poroso incluyendo humero derecho parte distal y los dos lados de tibiotarso. Unas huellas de corte en tibiotarso izquierda parte distal. Los huesos presenta mucha porocidad, y la proporcion entre carpometacarpo-humero y tibiotarso presenta evidencia que las alas todavia no fueron completamente desarollados, la cual interpretamos como evidencia de que se trata de un individuo joven, y por lo mismo afecto los huesos mas.

Modificaciones del superficie

Mod presente? True

\# de huellas 15

Ubicacion: Tibiotarso izq, humero izq y der

\# de patologias:

Ubicacion

\# modificaciones:

Ubicacion:

Notas modificaciones: Varias huellas de cortes muy chicos y no muy profundos en humero derecho y izquerido. Tibiotarso izquierdo en la parte distal donde se ve muy poroso como si fuera consumido (gastric etching).

Consolidantes

Uso consolidante?:

Que tipo

Notas:

Medidas del craneo

Long max craneal:	0
Ancho neurocraneo:	0
Ancho interorbital:	0
Longitud mand:	0

Elementos anatomicos toraxicos

	Izq	Der
Humero	70.5	70.7
Radio	74.1	-998
Ulna	0	-998
Carpomet	37.3	0

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	
Axis:		2a Tor	
3a Cerv:	0	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	0	1a Lum	
6a Cerv:	0	2a Lum	
7a Cerv:	0	3a Lum	
8a Cerv:	0	4a Lum	
9a Cerv:	0	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	3.42

Fusion de vert

Falange 1	0	0
Falange 2	10.7	0
Digito 3	0	0
Polex		0

Elementos anatomicos posteriores

Femur	0	0
Tibiotarso	-998	-998
Fibula	0	0
Tarsomet	0	0
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	0	0								
II	0		0	0						
III	0	0	0	0	0	0				
IV	0	0	0	0	0	0	0	0		0

AVE

No de Elemento:	1492	Entierro:	E.5	Class:	Aves	Age:	Adult
Specnumber:	163	Localidad:	T.8, E.5	Orden:	Columbiformes	Sex:	-998
Tipo de Material:	6	Asociacion:	W2	Familia:	Columbidae	Body part	Semi-complete
No de Catalogo:	PPL.Ba.O.16	Capa:	CXV	Genus:	-998		
No de Bolsa:		Elevation:		Specie:	-998		

Notes: Individuo casi completo, probablemente fue un individuo completo pero no se pudo recuperar por el tamano de los huesos.

Modificaciones del superficie

Mod presente? False

Ubicacion

de huellas

de patologias:

Ubicacion

modificaciones:

Ubicacion:

Notas modificaciones:

Consolidantes

Uso consolidante?: No

Notas: Solo se pego con Paraloid B-72.

Que tipo

Medidas del craneo

Long max craneal:	-998
Ancho neurocraneo:	-22.9
Ancho interorbital:	5.1
Longitud mand:	-998

Elementos anatomicos toraxicos

	Izq	Der
Humero	-998	-998
Radio	0	0
Ulna	-998	28.6
Carpomet	15.3	15

AVE

Medidas de la vertebra

Atlas:	0	1a Tor	3.7
Axis:		2a Tor	3.6
3a Cerv:	3.7	3a Tor	
4a Cerv:	0	4a Tor	
5a Cerv:	4	1a Lum	4.2
6a Cerv:	4.6	2a Lum	3.3
7a Cerv:	4.3	3a Lum	3.9
8a Cerv:	3.7	4a Lum	
9a Cerv:	3.3	5a Lum	
10a Cerv:	0	1a Cocc	
11a Cerv:	0	2a Cocc	
12a Cerv:	0	3a Cocc	
		4a Cocc	
		5a Cocc	
		Pigost	0

Fusion de vert

Falange 1	0	0
Falange 2	0	0
Digito 3	0	0
Polex	0	0

Elementos anatomicos posteriores

Femur	0	0
Tibiotarso	-34	0
Fibula	0	0
Tarsomet	-998	26.6
TM Prox W		

Fusion hueso largo:

Elementos de la garra

	Falange 1		Falange 2		Falange 3		Falange 4		Garra	
	Izq	Der	Izq	Der	Izq	Der	Izq	Der	Izq	Der
I	6.5	6.4							-998	
II	0		0	0						
III	0	0	0	0	0	0				
IV	0	0	0	0	0	0	0	0		0

Appendix G: Rattlesnake measurement

Table G.1 Rattlesnake (*Crotalus* sp.) vertebral measurements.

Burial	Ele #	Hueso	act	alct	aen	pr-pr	lc	hv	len	lden	po-pr	aco	alco	ah	alh	po/po	aci	lci	lpr	apr	lpa	apa	aan	lpo	apo
Ent.5	1507	VTM1	3.6	2.9	4.8	10.8	6.8	7.9	4.8	N/A	7.3	3.5	3.3	1.6	N/A	9.4	4.9	2.2	2.3	2.0	N/A	N/A	6.2	2.4	1.4
Ent.5	1507	VTM2	4.3	5.6	7.2	11.2	7.4	7.8	5.0	3.8	7.5	4.3	3.8	1.6	4.7	10.8	5.2	2.8	3.7	2.1	0.6	1.0	6.2	3.9	2.3
Ent.5	1507	VTM3	3.6	2.8	5.3	10.5	6.8	7.6	4.7	N/A	6.9	3.3	2.7	N/A	N/A	8.5	N/A	N/A	2.6	1.8	N/A	N/A	5.4	2.7	1.4
Ent.5	1507	VTM4	3.2	2.4	N/A	9.3	6.1	6.8	4.0	N/A	6.7	3.1	2.5	1.5	5.4	9.0	4.5	1.9	2.6	2.1	N/A	N/A	5.8	2.7	1.8
Ent.5	1507	VTM5	3.6	3.1	3.9	10.2	6.6	7.3	4.3	3.9	7.5	3.3	2.9	1.1	3.6	10.2	4.2	2.0	2.8	2.0	0.6	0.4	5.4	2.9	1.8
Ent.5	1507	VTM6	4.0	3.3	8.2	10.8	6.6	8.0	4.5	3.8	7.2	3.5	3.0	1.3	6.0	11.1	4.8	2.4	3.4	2.5	0.6	0.3	5.7	3.3	2.0
Ent.5	1507	VTM7	3.6	3.0	9.0	10.5	6.8	7.9	4.7	4.3	7.1	3.3	2.8	N/A	N/A	9.8	4.8	2.3	3.3	2.3	0.5	0.3	5.6	2.8	2.0
Ent.5	1507	VTM8	3.4	3.2	N/A	10.3	6.3	7.4	4.4	N/A	7.5	3.6	2.8	1.1	5.5	9.4	4.4	2.2	3.1	2.0	0.6	0.4	5.8	2.4	1.9
Ent.5	1507	VTM9	4.1	3.5	6.6	11.8	7.3	8.5	4.8	4.3	7.6	3.6	3.5	1.3	5.4	10.9	5.3	2.3	3.8	2.3	0.8	0.4	6.4	2.5	2.1
Ent.5	1507	VTM10	2.9	2.2	N/A	8.6	5.8	7.6	4.5	N/A	7.5	3.0	2.7	0.7	5.7	9.0	4.1	1.9	3.1	2.0	N/A	N/A	5.0	2.7	1.9
Ent.5	1507	VTP1	3.2	2.5	N/A	8.7	6.6	4.7	3.0	N/A	6.6	3.1	2.2	1.1	2.3	8.1	3.1	1.9	2.2	1.5	0.9	1.0	4.6	2.2	1.8
Ent.5	1507	VTP2	2.7	2.0	3.3	8.2	5.9	5.1	3.3	3.0	6.5	2.8	2.6	0.8	2.2	7.4	3.9	1.5	2.1	1.3	1.0	0.6	4.1	1.7	2.0
Ent.5	1507	VTP3	3.2	2.8	N/A	9.0	5.7	5.1	4.2	N/A	6.9	3.2	2.4	1.1	2.0	8.0	3.8	1.9	2.5	1.6	0.9	0.5	4.6	2.4	1.7
Ent.5	1507	VTP4	2.7	2.5	N/A	N/A	5.3	4.2	4.1	N/A	5.8	2.9	1.9	1.0	N/A	7.5	3.3	2.0	2.2	1.7	0.8	0.5	4.0	1.9	1.8
Ent.5	1507	VTP5	3.2	2.4	3.0	8.6	5.7	5.2	4.5	2.8	6.8	3.0	2.6	1.0	2.2	8.5	3.4	2.3	2.4	1.2	0.9	0.6	4.3	2.2	1.6
Ent.5	1037	VTM1	3.4	2.9	N/A	N/A	6.7	7.4	4.7	N/A	7.1	3.1	3.2	1.5	7.6	9.9	2.9	2.1	2.5	1.6	0.6	0.6	6.1	2.1	2.1
Ent.5	1037	VTM2	3.1	2.8	N/A	10.3	6.6	7.7	4.0	N/A	6.4	3.0	2.9	1.5	N/A	10.1	2.3	2.5	2.3	1.9	0.4	0.4	6.1	2.4	1.7
Ent.5	1037	VTM3	3.9	3.1	N/A	11.9	7.9	8.6	5.0	N/A	6.3	3.5	3.1	1.8	8.2	N/A	3.2	2.8	3.2	2.1	0.6	0.5	7.0	2.9	2.0
Ent.5	1037	VTM4	3.8	3.4	11.8	12.7	7.7	9.5	5.1	5.0	8.2	3.6	3.4	2.1	8.5	10.4	3.6	2.4	3.3	1.9	0.9	0.7	7.5	3.2	2.5
Ent.5	1037	VTM5	4.2	3.9	9.3	12.4	7.0	8.4	5.4	N/A	7.7	3.6	3.8	2.1	N/A	11.1	3.4	3.2	3.2	2.0	N/A	0.6	7.3	3.3	2.0
Ent.5	1037	VTM6	4.2	3.7	10.3	10.5	7.2	8.8	N/A	4.6	7.0	3.3	3.4	2.2	N/A	N/A	2.9	2.0	3.1	1.7	0.4	0.6	7.0	2.8	2.4
Ent.5	1037	VTM7	4.4	3.4	N/A	15.4	8.2	9.9	5.4	N/A	8.8	3.9	3.7	2.6	N/A	15.1	4.8	2.6	4.4	2.5	N/A	N/A	9.2	4.5	2.1
Ent.5	1037	VTM8	4.1	4.0	N/A	N/A	7.6	9.5	5.1	N/A	8.6	3.7	3.6	1.7	N/A	12.8	4.2	2.5	3.6	2.5	0.4	0.6	8.7	4.0	2.4
Ent.5	1037	VTM9	4.0	3.6	N/A	N/A	7.4	9.8	5.7	N/A	8.7	3.9	3.7	2.6	N/A	14.3	4.0	2.7	3.7	2.1	1.0	0.6	8.9	4.7	2.2
Ent.5	1037	VTM10	3.8	4.0	N/A	11.1	6.8	7.8	5.3	N/A	7.7	3.5	3.1	2.0	N/A	N/A	2.8	2.5	2.3	2.1	0.3	0.6	7.3	2.9	1.6
Ent.5	1037	VTP1	3.0	2.6	N/A	9.5	6.6	7.5	4.8	N/A	6.2	2.8	2.9	1.5	N/A	9.4	4.5	1.7	2.2	1.7	N/A	N/A	5.8	2.9	1.7
Ent.5	1037	VTP2	3.1	3.0	N/A	N/A	5.6	7.1	4.5	N/A	6.6	3.1	2.7	1.7	N/A	11.0	4.4	1.7	1.7	1.6	0.4	0.2	6.0	2.4	2.3
Ent.5	1037	VTP3	3.2	3.0	N/A	9.2	6.2	7.0	4.3	N/A	6.5	2.6	2.5	1.9	N/A	8.8	4.2	2.0	2.4	1.9	0.4	0.3	5.9	2.3	1.9
Ent.5	1037	VTP4	3.3	3.1	N/A	9.5	6.8	7.2	4.4	N/A	6.7	2.7	2.7	1.6	N/A	9.0	4.4	1.8	2.3	1.6	N/A	N/A	5.6	2.9	1.9
Ent.5	1037	VTP5	3.4	3.0	N/A	9.0	6.1	6.7	4.9	N/A	6.1	2.7	2.4	N/A	N/A	N/A	4.5	1.8	1.9	1.6	N/A	N/A	5.1	2.3	1.8
Ent.5	1489.1	VTM1	2.1	2.0	2.0	6.4	5.2	4.3	3.2	3.2	5.2	2.2	2.0	0.8	2.3	6.2	2.8	1.6	1.8	1.2	0.6	0.3	3.7	1.2	1.3
Ent.5	1489.1	VTM2	2.1	2.2	2.4	6.2	5.0	4.1	2.6	3.0	4.8	2.3	2.1	0.8	2.6	6.5	3.0	1.3	1.6	1.3	0.3	0.3	3.6	1.2	1.2
Ent.5	1489.1	VTM3	2.4	2.3	3.1	7.1	5.5	4.9	3.0	3.2	5.5	2.4	2.1	1.0	2.7	7.2	3.4	1.8	1.8	1.4	0.5	0.5	4.2	1.6	1.4

Table G.1 Continued

Burial	Ele #	Hueso	act	alct	aen	pr-pr	lc	hv	len	lden	po-pr	aco	alco	ah	alh	po/po	aci	lci	lpr	apr	lpa	apa	aan	lpo	apo
Ent.5	1489.1	VTM4	2.2	2.4	3.1	7.7	5.3	5.4	3.2	3.2	5.6	2.5	2.2	1.0	3.6	6.9	3.6	1.9	1.9	1.5	0.7	0.5	4.5	1.4	1.4
Ent.5	1489.1	VTM5	2.5	2.7	3.2	7.4	5.4	5.4	3.1	3.4	5.5	2.5	2.3	1.0	2.7	7.2	3.6	1.8	2.4	1.7	0.5	0.6	4.4	1.8	1.3
Ent.5	1489.1	VTM6	2.4	2.5	3.4	7.4	4.9	5.7	2.9	3.5	5.6	2.6	2.6	1.0	2.6	7.3	3.4	1.8	2.0	1.4	0.5	0.5	4.6	1.8	1.5
Ent.5	1489.1	VTM7	2.6	2.5	3.5	7.2	4.9	5.4	2.9	3.2	5.6	2.4	2.4	1.0	2.8	7.4	3.6	1.7	1.9	1.4	0.5	0.3	4.6	1.9	1.5
Ent.5	1489.1	VTM8	2.7	2.1	2.8	7.1	4.7	4.8	3.1	3.3	5.5	2.6	2.3	0.9	3.6	7.2	3.4	1.4	1.7	1.4	0.5	0.5	4.2	1.6	1.4
Ent.5	1489.1	VTM9	2.7	2.4	3.2	7.2	4.9	5.1	3.2	3.6	5.7	2.5	2.2	0.9	3.0	7.5	3.5	1.8	2.0	1.5	0.6	0.4	4.4	1.7	1.4
Ent.5	1489.1	VTM10	2.3	2.2	2.9	6.8	4.8	4.5	2.9	3.3	5.1	2.3	2.1	0.8	2.5	6.6	3.2	1.7	1.4	1.5	0.4	0.3	3.8	1.5	1.3
Ent.5	1489.1	VTP1	2.1	2.1	2.5	5.5	4.7	3.6	2.5	2.8	4.9	2.0	1.8	0.6	2.4	5.7	2.8	1.5	1.4	1.2	0.5	0.3	3.0	1.6	1.1
Ent.5	1489.1	VTP2	2.0	1.8	2.0	4.7	3.9	3.5	2.3	2.4	4.3	1.8	1.5	0.6	2.1	4.5	2.5	1.5	1.2	1.1	0.3	0.3	2.9	1.3	1.0
Ent.5	1489.1	VTP3	1.9	1.8	1.5	5.0	4.0	3.5	2.3	2.4	4.3	1.7	1.6	0.6	2.2	4.2	2.4	1.5	1.3	1.0	0.4	0.4	2.7	1.2	1.0
Ent.5	1489.1	VTP4	1.6	1.2	1.5	4.6	3.4	2.6	1.8	2.1	3.9	1.5	1.3	0.5	1.8	3.9	2.1	1.0	1.1	0.9	0.3	0.3	2.3	1.1	0.9
Ent.5	1489.1	VTP5	1.8	1.6	1.4	4.4	3.6	2.9	1.9	2.2	3.9	1.5	1.3	0.5	1.5	3.7	2.0	1.0	1.0	0.9	0.2	0.3	2.3	1.3	0.9
Ent.5	1489.2	VTM1	4.2	3.9	7.1	13.9	8.1	8.8	5.9	4.9	9.0	3.0	3.1	2.3	N/A	12.7	5.6	2.7	3.6	2.3	N/A	N/A	8.4	3.1	2.2
Ent.5	1489.2	VTM2	3.6	4.5	6.8	13.5	7.8	9.0	5.8	5.1	8.4	3.4	3.8	2.2	N/A	13.6	5.3	2.2	4.0	2.3	1.5	1.1	8.0	3.8	2.6
Ent.5	1489.2	VTM3	3.6	3.7	7.5	13.1	7.6	8.6	5.6	4.8	8.9	3.3	3.2	2.1	N/A	11.5	5.5	2.4	3.9	2.1	1.2	1.0	8.2	3.1	2.6
Ent.5	1489.2	VTM4	3.7	4.0	6.7	13.2	7.9	8.6	5.6	5.3	8.4	3.5	3.7	2.1	N/A	12.3	5.7	2.2	3.8	2.1	1.7	1.3	8.2	3.5	2.1
Ent.5	1489.2	VTM5	4.2	4.3	12.2	15.9	8.0	10.3	5.9	4.9	9.0	4.4	3.8	2.8	9.8	N/A	6.6	2.8	5.1	2.9	1.3	1.3	9.4	4.9	2.8
Ent.5	1489.2	VTP1	3.6	3.0	N/A	11.8	7.0	7.7	5.1	N/A	7.2	3.2	3.0	1.4	4.3	9.3	4.7	1.8	3.4	2.0	1.1	0.9	6.8	3.5	2.4
Ent.5	1489.2	VTP2	3.3	3.4	N/A	12.4	7.0	8.0	5.0	N/A	7.9	3.2	3.1	1.5	4.8	10.9	4.9	2.4	3.6	2.0	1.2	0.9	7.0	3.2	2.1
Ent.5	1489.2	VTP3	3.6	3.9	N/A	12.2	7.2	8.0	5.1	N/A	8.1	3.1	2.9	1.4	5.1	10.9	4.8	2.2	2.9	1.8	N/A	N/A	6.9	3.5	2.1
Ent.5	1489.2	VTP4	3.4	3.6	5.8	11.9	6.8	7.3	5.1	3.2	8.6	2.9	3.4	1.7	N/A	N/A	4.9	1.9	3.0	1.9	0.9	0.8	6.6	N/A	2.0
Ent.5	1489.2	VTP5	3.5	3.2	4.8	12.0	6.6	7.2	5.0	3.5	7.9	2.8	3.0	1.4	4.1	9.7	4.8	2.1	3.6	1.8	1.1	0.9	7.0	3.5	2.0
Ent.5	1063	VTM1	2.3	2.2	3.2	6.4	4.3	4.7	2.9	3.0	5.1	1.9	2.0	0.9	3.4	6.7	3.2	1.6	1.8	1.4	2.1	1.5	3.7	1.6	1.4
Ent.5	1063	VTM2	2.4	2.4	2.1	6.7	4.1	4.4	2.5	3.0	5.2	2.3	2.2	1.0	2.2	6.6	3.4	1.7	2.0	1.4	1.7	1.4	4.2	1.6	1.4
Ent.5	1063	VTM3	2.9	2.1	2.0	6.6	4.0	3.9	2.3	2.7	4.8	2.2	2.1	0.7	N/A	5.7	3.1	1.3	1.7	1.3	1.8	1.2	4.0	1.3	1.0
Ent.5	1063	VTM4	2.3	1.8	1.7	5.8	3.7	3.7	2.4	2.5	4.7	2.3	1.8	0.7	1.3	5.6	2.9	1.1	1.6	1.2	1.5	1.1	3.2	1.3	1.2
Ent.5	1063	VTM5	2.4	1.9	1.5	5.8	4.0	3.4	2.3	2.6	2.6	2.3	1.8	0.6	1.5	5.6	2.8	1.4	1.6	1.2	1.5	1.1	3.5	1.4	1.1
Ent.5	1063	VTP1	1.8	1.7	1.1	4.8	3.8	2.9	2.0	2.1	4.0	1.4	1.5	0.5	1.0	4.4	2.4	1.2	1.1	1.1	0.4	0.3	2.7	1.2	1.0
Ent.5	1063	VTP2	2.1	1.5	1.0	5.2	3.8	3.1	2.0	2.3	4.0	1.8	1.5	0.5	1.0	4.5	2.5	1.2	1.3	1.0	0.3	0.3	2.8	1.6	1.0
Ent.5	1063	VTP3	2.0	1.6	1.0	5.0	3.5	2.8	2.2	2.1	3.8	1.8	1.5	0.8	1.1	4.3	2.5	1.2	1.2	1.1	0.3	0.3	2.6	1.6	1.0
Ent.5	1063	VTP4	1.3	1.3	0.9	3.8	2.6	2.5	1.7	1.6	2.8	1.1	0.8	0.4	0.9	3.6	2.0	0.9	1.1	0.9	0.2	0.3	2.2	1.0	0.9
Ent.5	1063	VTP5	1.3	1.1	1.2	3.7	2.8	2.3	1.6	1.5	3.0	1.1	1.1	0.4	0.7	3.6	2.0	0.9	0.9	0.9	0.3	0.4	2.1	1.0	0.8
Ent.5	1552	VTM1	3.2	2.5	4.7	N/A	6.6	7.1	4.9	4.5	7.9	2.6	2.7	1.1	N/A	10.8	4.3	2.0	3.2	2.0	1.0	0.7	6.6	3.6	2.1
Ent.5	1552	VTM2	3.0	3.2	4.3	11.2	7.2	7.2	5.1	4.8	8.6	3.0	2.7	1.7	N/A	N/A	4.6	1.9	3.0	1.8	0.9	0.7	6.6	3.6	2.3
Ent.5	1552	VTM3	3.2	2.9	N/A	10.9	7.2	7.4	4.6	N/A	7.7	3.1	2.7	1.5	N/A	11.4	4.7	2.3	3.4	2.4	0.7	0.8	7.0	3.2	2.3

Table G.1 Continued

Burial	Ele #	Hueso	act	alct	aen	pr-pr	lc	hv	len	lden	po-pr	aco	alco	ah	alh	po/po	aci	lci	lpr	apr	lpa	apa	aan	lpo	apo
Ent.5	1552	VTM4	3.2	2.9	4.4	N/A	6.8	7.4	5.1	4.6	7.7	2.6	2.7	1.4	N/A	10.5	4.6	1.8	3.0	1.9	0.8	0.7	6.5	3.2	2.2
Ent.5	1552	VTM5	3.2	2.9	N/A	11.9	6.8	7.1	5.1	N/A	7.8	2.8	2.7	1.3	N/A	11.6	4.8	2.3	3.9	1.7	0.8	0.6	6.9	3.0	2.0
Ent.5	1552	VTP1	3.1	2.9	N/A	10.6	6.6	7.0	5.2	N/A	7.8	2.4	2.6	1.5	N/A	9.9	4.4	1.7	3.4	2.1	1.0	0.9	6.3	3.2	1.9
Ent.5	1552	VTP2	3.1	2.5	N/A	10.4	6.7	6.2	4.6	N/A	7.4	2.8	2.4	1.2	3.4	9.5	4.2	2.1	3.4	1.9	0.8	0.8	5.6	3.2	1.8
Ent.5	1552	VTP3	3.0	3.0	N/A	9.8	6.9	6.4	4.6	N/A	7.5	2.8	2.6	1.5	N/A	10.5	4.4	1.9	3.2	2.0	0.8	0.6	6.7	3.0	1.9
Ent.5	1552	VTP4	3.0	2.5	N/A	N/A	6.0	6.1	4.5	N/A	7.3	2.6	2.3	1.3	3.5	9.5	4.0	1.9	2.3	1.9	0.8	0.6	5.1	2.7	1.3
Ent.5	1552	VTP5	3.3	2.9	N/A	N/A	6.2	6.4	4.3	N/A	N/A	2.2	2.3	1.3	N/A	N/A	4.1	2.1	2.6	1.8	1.0	0.4	5.2	N/A	N/A
Ent.5	1494	VTM1	2.5	2.4	1.8	6.4	5.2	4.4	3.3	3.0	5.1	2.4	2.1	0.9	2.0	6.5	3.0	1.5	1.7	1.3	1.0	0.7	3.3	1.7	1.3
Ent.5	1494	VTM2	2.6	2.5	2.4	6.5	5.2	4.6	3.5	3.3	5.6	2.4	2.1	1.0	2.0	6.6	3.0	1.4	1.9	1.3	1.1	0.6	3.8	1.6	1.4
Ent.5	1494	VTM3	2.8	2.7	2.5	6.9	4.8	4.8	3.3	3.3	5.8	2.4	2.1	1.0	2.5	6.7	3.2	1.5	2.1	1.3	0.9	0.9	3.9	1.6	1.4
Ent.5	1494	VTM4	3.0	2.5	2.9	7.4	5.9	5.1	3.5	3.5	6.0	2.5	2.4	1.0	2.7	7.0	3.4	1.4	1.8	1.4	0.9	0.9	4.4	1.8	1.6
Ent.5	1494	VTM5	2.2	2.5	3.5	7.1	4.9	5.1	3.4	3.0	5.3	2.1	2.4	1.0	2.9	7.0	3.4	1.5	1.9	1.4	0.8	0.8	3.9	1.8	1.6
Ent.5	1494	VTM6	2.1	2.5	3.5	6.6	4.4	5.1	3.1	3.1	5.3	2.3	2.3	1.0	3.0	6.8	3.3	1.5	1.9	1.4	0.7	0.8	3.8	1.7	1.6
Ent.5	1494	VTM7	2.7	2.7	2.8	7.5	5.2	5.1	3.7	3.6	5.7	2.5	2.6	1.1	2.9	7.2	3.5	1.7	1.9	1.6	0.5	0.5	4.4	1.7	1.7
Ent.5	1494	VTM8	2.6	2.7	3.3	7.4	5.1	5.5	3.4	3.5	5.6	2.6	2.0	1.2	3.1	7.2	3.7	1.9	2.0	1.5	0.8	0.8	4.3	1.8	1.7
Ent.5	1494	VTM9	2.7	2.7	4.0	7.4	5.4	6.1	3.3	3.5	5.8	2.6	2.4	1.1	3.4	7.5	3.6	1.7	1.9	1.5	0.9	0.8	4.3	1.9	1.7
Ent.5	1494	VTM10	2.7	2.5	3.5	7.4	5.1	5.6	3.4	3.4	5.7	2.5	2.5	1.0	2.9	7.4	3.7	1.7	2.0	1.3	0.9	0.7	4.2	1.7	1.6
Ent.5	1494	VTP1	1.8	1.9	1.7	5.3	4.5	3.4	2.9	3.1	4.8	1.8	1.6	0.8	1.8	5.3	2.5	1.0	1.2	1.1	0.5	0.7	3.0	1.4	1.4
Ent.5	1494	VTP2	1.9	1.9	1.8	5.1	4.2	3.3	2.8	2.8	4.4	1.5	1.6	0.6	1.3	5.1	2.4	1.0	1.4	1.1	0.5	0.7	2.7	1.1	1.1
Ent.5	1494	VTP3	1.7	1.6	1.4	4.5	3.8	3.0	2.4	2.4	4.3	1.5	1.4	0.6	1.1	4.3	2.2	0.8	1.2	1.0	0.5	0.5	2.3	1.0	1.1
Ent.5	1494	VTP4	1.7	1.5	1.3	4.5	3.9	3.0	2.4	2.3	4.0	1.5	1.1	0.5	1.0	4.2	2.1	0.9	1.5	0.9	0.9	0.5	2.3	1.0	1.0
Ent.5	1494	VTP5	1.2	1.2	1.0	3.8	3.2	2.4	1.7	1.8	3.1	1.0	1.0	0.6	0.8	3.4	1.9	0.8	0.9	0.8	0.5	0.4	1.9	0.8	0.8
Ent.5	1568	VTP1	3.0	2.5	N/A	9.9	6.2	6.1	4.3	N/A	7.1	2.4	2.4	1.1	3.6	9.8	3.7	1.8	2.2	2.1	1.0	0.9	5.5	2.6	2.2
Ent.5	1568	VTP2	3.1	2.5	4.6	9.7	5.9	6.3	4.3	4.3	6.9	2.3	2.3	1.0	3.2	N/A	3.9	1.7	2.4	2.0	1.2	0.8	5.3	2.6	2.1
Ent.5	1568	VTP3	2.9	2.2	4.0	8.9	6.0	5.5	4.4	4.2	7.1	2.6	2.1	0.9	N/A	8.7	3.6	1.8	2.7	2.1	1.1	0.9	4.7	2.5	2.1
Ent.5	1568	VTP4	2.5	3.0	3.8	8.6	5.8	5.1	4.1	4.2	7.1	2.2	1.8	1.0	2.9	8.6	3.5	1.7	2.7	2.0	1.1	0.9	4.8	2.4	2.0
Ent.5	1568	VTP5	2.3	2.2	3.9	8.6	5.7	5.3	3.8	4.0	6.8	2.1	2.0	1.2	N/A	N/A	3.5	1.4	2.7	2.0	1.0	0.8	4.4	2.6	2.0
Ent.5	1021	VTM1	4.6	3.9	N/A	14.5	8.7	10.1	6.7	N/A	10.5	4.1	3.6	N/A	N/A	12.9	6.7	2.3	3.4	2.4	1.5		9.9	3.1	2.7
Ent.5	1021	VTM2	4.4	3.7	N/A	14.5	8.1	10.2	6.8	N/A	9.4	3.9	3.9	N/A	N/A	14.3	6.6	2.5	4.4	2.6	N/A		10.0	4.0	2.7
Ent.5	1021	VTM3	4.6	4.2	N/A	15.9	8.1	10.3	7.0	N/A	9.9	3.9	3.6	N/A	N/A	14.7	5.9	2.2	4.0	2.6	N/A		9.4	4.6	2.6
Ent.5	1021	VTM4	4.4	4.3	12.3	14.8	7.5	10.5	6.8	4.7	10.2	4.1	3.6	2.0	N/A	N/A	6.6	2.0	3.9	2.4	1.1		9.8	3.9	2.1
Ent.5	1021	VTM5	4.4	4.2	13.1	14.6	8.0	10.5	7.5	6.1	9.6	4.1	3.7	N/A	N/A	16.3	6.0	2.3	4.3	2.5	N/A		9.7	4.4	2.7
Ent.5	1021	VTP1	4.3	3.9	N/A	13.0	7.3	10.4	6.1	N/A	9.3	3.6	3.7	N/A	N/A	13.1	6.2	2.6	3.7	2.4	N/A		9.3	3.3	2.4
Ent.5	1021	VTP2	4.6	4.0	N/A	13.3	7.5	9.7	7.1	N/A	9.6	3.9	3.9	N/A	N/A	-12.0	N/A	N/A	3.5	2.5	N/A		9.7	3.4	2.7
Ent.5	1021	VTP3	4.7	4.1	N/A	13.9	7.0	9.8	6.7	N/A	10.4	3.7	3.2	N/A	N/A	11.7	6.4	2.5	4.0	2.5	N/A		9.4	2.9	2.4

Table G.1 Continued

Burial	Ele #	Hueso	act	alct	aen	pr-pr	lc	hv	len	lden	po-pr	aco	alco	ah	alh	po/po	aci	lci	lpr	apr	lpa	apa	aan	lpo	apo
Ent.5	1021	VTP4	4.7	4.1	N/A	15.5	7.3	10.4	8.0	N/A	9.3	4.0	3.7	N/A	N/A	N/A	7.2	3.0	4.8	2.7	1.8		9.8	3.8	2.6
Ent.5	1021	VTP5	4.3	4.0	-5.0	13.4	7.1	9.8	5.9	-5.5	9.6	3.7	3.4	N/A	N/A	12.0	5.4	2.5	3.9	2.6	1.6		9.0	3.4	2.5
Ent.5	1022.1	VTM1	3.7	3.8	9.6	10.8	6.8	7.9	5.2	N/A	7.5	3.2	2.9	1.3	N/A	10.8	4.8	1.7	2.9	1.9	1.0		6.4	2.7	2.0
Ent.5	1022.1	VTM2	3.9	3.4	N/A	10.4	7.2	7.9	5.5	N/A	7.7	3.4	3.1	1.5	4.9	10.3	5.0	1.9	2.6	2.0	0.6		6.3	2.4	1.8
Ent.5	1022.1	VTM3	4.8	4.0	N/A	10.5	6.8	7.4	5.6	N/A	7.4	3.5	3.1	1.1	N/A	N/A	5.3	1.9	3.1	2.2	N/A		6.6	3.2	1.9
Ent.5	1022.1	VTM4	4.3	3.9	9.1	11.3	7.5	7.7	5.3	4.4	7.8	3.7	3.3	1.4	5.3	10.8	4.9	1.8	3.5	2.1	0.9		6.4	2.7	1.9
Ent.5	1022.1	VTM5	4.0	3.4	N/A	10.8	6.9	7.3	5.0	N/A	8.0	3.6	3.3	1.4	5.9	11.0	5.0	1.9	2.9	2.2	0.9		6.4	2.9	2.2
Ent.5	1022.2	VTM1	2.8	2.3	6.3	7.1	5.2	5.1	5.8	2.9	5.9	2.4	2.0	1.0	6.5	7.3	3.5	1.4	1.9	1.7	N/A		4.0	1.8	1.8
Ent.5	1022.2	VTM2	2.8	2.3	6.7	6.8	5.3	4.8	3.6	2.9	5.9	2.2	1.9	1.0	4.9	7.1	3.5	1.4	1.9	1.8	N/A		3.9	1.6	1.9
Ent.5	1022.2	VTM3	2.6	2.0	6.6	7.4	5.0	5.0	3.3	3.2	6.2	2.5	2.0	N/A	N/A	7.4	3.5	1.5	2.1	1.6	N/A		4.3	1.9	1.8
Ent.5	1022.2	VTM4	2.9	2.4	6.8	7.3	5.3	4.9	3.4	2.9	5.9	2.5	2.1	1.0	5.1	7.5	3.4	1.5	2.0	1.8	N/A		4.0	1.9	1.8
Ent.5	1022.2	VTM5	2.8	2.4	6.0	7.3	5.2	5.1	3.5	2.8	5.7	2.4	2.0	1.0	4.9	7.3	3.5	1.5	1.8	1.8	N/A		3.9	1.6	1.7
Ent.5	1022.2	VTP1	2.6	2.2	N/A	6.9	5.0	5.0	3.2	N/A	5.6	2.1	1.9	1.0	4.6	6.6	3.4	1.3	1.9	1.7	N/A		3.9	1.8	1.7
Ent.5	1022.2	VTP2	2.5	2.0	6.7	6.7	4.7	5.0	2.8	2.5	5.4	2.0	1.8	1.0	4.6	6.8	3.2	1.2	1.7	1.6	N/A		3.8	2.3	1.9
Ent.5	1022.2	VTP3	2.6	2.2	6.8	6.8	4.7	4.5	3.5	2.5	5.4	2.1	1.9	1.0	4.8	6.8	3.3	1.1	1.7	1.7	N/A		4.0	1.8	1.8
Ent.5	1022.2	VTP4	2.7	2.2	6.9	6.9	5.1	4.9	3.5	2.6	5.7	2.2	1.9	1.0	4.8	7.1	3.4	1.4	2.0	1.8	N/A		3.9	1.5	1.8
Ent.5	1022.3	VTP1	2.6	2.5	3.2	6.8	4.9	4.6	3.4	3.3	5.3	2.3	2.2	1.0	3.0	7.0	3.2	1.3	1.9	1.3	0.5		3.9	1.4	1.5
Ent.5	1023.3	VTP2	1.9	1.9	2.7	5.0	3.8	3.6	2.3	2.4	4.4	1.7	1.6	0.8	3.4	5.2	2.7	1.2	1.5	1.0	0.3		3.0	1.3	1.3
Ent.2	252	VTM1	3.4	3.0	4.2	8.7	5.3	5.6	3.4	3.8	6.0	2.7	2.7	1.2	4.6	8.8	3.9	1.7	2.4	1.8	0.6		4.6	2.3	1.7
Ent.2	252	VTM2	3.3	3.1	3.8	9.0	5.8	5.4	3.5	3.8	6.1	2.9	2.7	1.1	4.1	7.8	4.0	1.6	3.0	1.6	0.8		4.9	2.3	1.6
Ent.2	252	VTM3	3.2	2.8	3.8	8.8	5.4	5.3	3.4	3.5	5.9	2.8	2.6	1.2	5.1	8.9	3.9	1.5	2.8	1.6	0.5		4.8	2.6	1.7
Ent.2	252	VTM4	3.3	2.9	3.7	8.9	5.8	5.7	3.6	4.0	6.3	2.9	2.7	1.2	4.6	8.9	4.0	1.7	3.0	1.7	0.6		4.9	2.5	1.7
Ent.2	252	VTM5	2.7	2.5	4.1	7.2	4.6	4.8	3.1	3.1	5.6	2.4	2.3	1.0	3.9	7.3	3.3	1.6	2.1	1.7	0.4		4.0	1.8	1.6
Ent.2	252	VTP1	2.7	2.2	2.5	5.9	4.5	4.3	2.3	2.5	5.0	2.3	2.0	0.8	3.0	5.9	3.0	1.4	1.5	1.2	0.5		3.5	1.5	1.4
Ent.2	252	VTP2	2.8	2.3	3.7	6.7	4.7	4.5	2.6	2.8	5.1	2.3	2.1	1.0	4.0	6.9	3.1	1.5	2.0	1.6	0.3		3.5	2.1	1.6
Ent.2	252	VTP3	3.1	2.4	2.6	6.1	4.6	4.0	2.8	2.6	5.2	2.4	2.1	0.8	2.5	5.9	3.0	1.4	1.3	1.2	0.5		3.7	1.4	1.4
Ent.2	252	VTP4	2.7	2.3	2.9	6.0	4.6	4.3	2.3	2.5	5.0	2.3	2.1	0.8	2.6	5.8	3.0	1.4	1.5	1.3	0.5		3.4	1.5	1.5
Ent.2	252	VTP5	3.0	2.3	N/A	7.1	5.1	4.1	3.1	N/A	5.4	2.5	2.1	0.8	2.8	7.0	3.0	1.2	2.0	1.4	0.5		3.8	1.6	1.4

Appendix H: Isotope Analysis

Table H.1 Data of all isotope samples included in this study. Grey cells indicate samples that did not pass diagenesis tests and were not included in the results.

Lab #	Burial	Ele #	Animal	Element	Comp.	Collagen weight	% Yield	%N	%C	C:N Raw	C:N (12/14)	C/P	IR-SF	15 N_{col}	$13C_{col}$	$13C_{ap}$	$18O_{ap}$
AS-0092	Ent.2	81.1	Eagle	Phalange	Yes	32.00	7.50	14.48	40.99	2.83	3.30	0.16	3.00	9.03	-11.63	-6.9	24.4
AS-0093	Ent.2	81.2	Lag.	Tibia	No	-	-					0.06	3.21			-9.5	21.9
AS-0094	Ent.2	120	Eagle	Phalange	Yes	223.40	21.23	16.08	44.62	2.77	3.24	0.37	2.75	8.77	-11.12	-3.4	25.8
AS-0095	Ent.2	154	Felid	Femur	Yes	14.90	1.41	1.39	8.96	6.46	7.53	0.11	2.93	8.69	-18.09	-4.1	20.9
AS-0096	Ent.2	213.1	Canid	Astragalus	Yes	217.50	18.69	16.00	44.22	2.76	3.23	0.03	3.62	6.78	-15.60	-9.9	26.5
AS-0097	Ent. 3	571	Felid	Cranium	No	25.90	2.70	12.92	37.05	2.87	3.35	0.12	3.02	7.91	-11.93	-14.6	23.4
AS-0098	Ent. 3	572	Canid	Cranium	No	8.00	1.03	0.56	8.16	14.51	16.93	0.07	3.23	7.57	-25.77	-12.7	25.1
AS-0099	Ent. 3	573.1	Canid	Cranium	No	11.90	0.92	0.93	21.90	23.62	27.56	0.06	3.27	10.79	-27.80	-16.0	23.3
AS-0100	Ent. 3	632.1	Felid	Cranium	No	-	-	-	-	-	-	0.06	3.35	-	-	-15.3	24.2
AS-0101	Ent. 3	632.2	Felid	Mand	No	-	-	-	-	-	-	0.16	3.09	-	-	-15.4	23.9
AS-0102	Ent. 5	1381.1	Felid	Cranium	No	-	-	-	-	-	-	0.08	3.12	-	-	-16.1	26.3
AS-0103	Ent. 5	1500	Felid	Cranium	No	-	-	-	-	-	-	0.06	3.29	-	-	-8.8	27.6
AS-0104	Ent. 5	1508	Canid	Cranium	No	-	-	-	-	-	-	0.07	3.17	-	-	-13.2	23.7
AS-0105	Ent. 5	1636.2	Canid	Cranium	Yes	-	-	-	-	-	-	0.05	3.27	-	-	-10.1	25.5
AS-0106	Ent. 5	1638	Eagle	Phalange	Yes	-	-	-	-	-	-	0.07	3.22	-	-	-9.6	24.8
AS-0107	Ent.6	1818.1	Felid	MTII	Yes	213.20	21.38	16.05	44.38	2.77	3.23	0.31	3.08	11.75	-6.68	-2.7	25.9
AS-0108	Ent.6	1818.1	Felid	Cranium	Yes	10.80	1.28	6.47	32.51	5.02	5.86	0.12	3.4	7.56	-14.98	-3.4	25.6
AS-0109	Ent.6	1818.3	Lag.	Humero	No	39.20	14.98	15.36	43.01	2.80	3.27	0.35	2.64	4.77	-15.04	-5.3	27.5
AS-0110	Ent.6	2200	Eagle	Phalange	Yes	142.20	13.63	15.52	43.13	2.78	3.24	0.36	2.47	7.84	-14.15	-6.4	29.4
AS-0111	Ent.6	2244	Canid	Cranium	No	64.70	5.90	15.08	42.95	2.85	3.32	0.29	2.53	5.98	-19.53	-10.1	17.8
AS-0112	OF2	209	Canid	Cranium	No	142.50	12.46	15.62	43.81	2.80	3.27	0.26	2.73	8.58	-11.68	-5.0	23.9
AS-0113	OF2	211.1	Eagle	Phalange	Yes	196.70	16.97	16.10	44.83	2.78	3.25	0.33	2.75	8.51	-14.26	-2.8	28.4
AS-0114	OF2	211.2	Lag.	Tibia	No	42.20	9.35	14.69	41.44	2.82	3.29	0.31	2.56	4.43	-12.80	-1.6	28.2
AS-0115	OF2	151, 309, 315	Felid	Cranium	No	194.40	17.97	16.58	45.88	2.77	3.23	0.38	2.51	6.81	-17.77	-7.6	28.5

Notes: Lag: Lagamorpha, MT: Metatarsus, Comp: Complete individual?, Prep: Prepared eagle specimen.

Table H.1 Continued

Lab #	Burial	Ele #	Animal	Element	Comp.	Collagen weight	% Yield	%N	%C	C:N Raw	C:N (12/14)	C/P	IR-SF	15 N_{col}	13C_{col}	13C_{ap}	18O_{ap}
AS-0116	Ent.6	2261	Eagle	Phalange	Prep	156.40	14.85	15.59	43.75	2.81	3.27	0.27	3.31	6.04	-15.84	-6.5	24.1
AS-0117	Ent.6	2246	Eagle	Phalange	Prep	195.20	17.71	15.80	44.40	2.81	3.28	0.22	2.76	8.08	-13.08	-5.9	24.7
AS-0118	Ent.6	2239	Eagle	Phalange	Prep	219.40	19.62	15.43	43.26	2.80	3.27	0.30	2.9	9.23	-11.13	-4.4	23.6
AS-0119	Ent.6	2226	Eagle	Phalange	Yes	151.80	14.57	15.55	43.45	2.79	3.26	0.10	3.11	9.11	-11.97	-3.9	24.2
AS-0120	Ent.6	2214	Eagle	Phalange	Yes	184.90	18.35	15.83	44.41	2.81	3.27	0.37	2.76	8.05	-13.54	-6.1	27.7
AS-0121	Ent.6	2193	Eagle	Phalange	Prep	136.10	13.39	15.6	42.66	2.7364	3.19	0.34	2.82	7.3999	-16.649	-7.9	26.8
AS-0122	Ent.6	2192	Eagle	Phalange	Yes	177.60	17.64	15.92	44.20	2.78	3.24	0.22	2.88	8.98	-12.97	-5.4	28.5
AS-0123	Ent.6	2070	Eagle	Phalange	Yes	166.00	16.47	16.3	44.7	2.7379	3.19	0.29	3.19	9.5209	-12.09	-4.8	27.2
AS-0124	Ent.6	2069.1	Eagle	Phalange	Yes	174.30	17.01	14.77	41.42	2.80	3.27	0.27	2.83	6.56	-16.57	-8.9	26.2
AS-0125	Ent.6	2047	Eagle	Phalange	Prep	110.40	10.87	15.17	42.98	2.83	3.30	0.16	2.89	8.12	-13.32	-4.6	24.5
AS-0126	Ent.6	2010	Eagle	Phalange	Prep	149.30	14.10	16.26	45.32	2.79	3.25	0.12	3.02	7.47	-14.55	-6.4	28.1
AS-0127	Ent.6	1983	Eagle	Phalange	Prep	168.40	14.78	16.13	44.95	2.79	3.25	0.36	3.13	6.31	-15.97	-8.4	28.5
AS-0128	Ent.6	1961	Eagle	Phalange	Yes	61.70	6.08	15.57	43.85	2.82	3.28	0.13	3.63	9.32	-12.75	-6.0	20.5
AS-0129	Ent.6	1888	Eagle	Phalange	Yes	109.80	10.98	-	-	-	-	0.14	2.89	-	-	-5.7	30.5
AS-0130	Ent.6	1887	Felid	Cranium	Yes	20.30	1.73	4.65	14	3.0124	3.51	0.14	3.29	8.36	-14.523	-7.8	25.8
AS-0131	Ent.6	1941	Felid	Cranium	No	4.20	0.40	-	-	-	-	0.07	3.44	-	-	-11.4	25.5
AS-0132	Ent.6	1984	Felid	Cranium	Yes	145.30	14.16	16.6	45.38	2.734	3.19	0.26	2.71	11.438	-6.1482	-2.8	26.8
AS-0133	Ent.6	1991.1	Felid	Falange	Yes	58.10	12.87	15.4	42.01	2.7364	3.19	0.19	3.25	7.5688	-14.56	-6.4	25.9
AS-0134	Ent.6	1991.1	Felid	Femur	Yes	168.00	16.12	16	43.87	2.7471	3.21	0.10	3.39	7.1377	-15.306	-6.1	26.6
AS-0135	Ent.6	2043	Felid	Cranium	No	37.00	14.48	15.2	42.16	2.7649	3.23	0.46	2.8	6.8918	-19.542	-10.9	28.3
AS-0136	Ent.6	2068	Felid	Cranium	No	-0.80	-0.14	-	-	-	-	0.07	3.13	-	-	-6.7	25.7
AS-0137	Ent.6	2195	Felid	Cranium	No	49.70	8.61	14.8	41.09	2.7837	3.25	0.11	2.94	8.6584	-15.389	-7.9	25.8
AS-0138	Ent.6	2227	Felid	Astragalus	Yes	133.20	12.13	15.9	44.08	2.7655	3.23	0.11	3.52	7.293	-14.226	-6.1	25.6
AS-0139	Ent.6	2245	Felid	Cranium	No	65.50	12.14	-	-	-	-	0.19	2.82	5.9749	-17.055	-9.1	28.1
AS-0140	Ent.2	121	Eagle	Phalange	Yes	203.70	19.35	16	44.36	2.7787	3.24	0.26	2.83	8.2167	-14.772	-6.7	26.3
AS-0141	Ent.2	143	Felid	Femur	Yes	62.20	11.96	0.95	13.99	14.752	17.21	0.08	3.22	8.9706	-20.308	-4.6	22.5
AS-0142	Ent.2	143	Felid	Cranium	Yes	-16.80	-1.52	15.1	42.26	2.8013	3.27	0.14	3.74	8.6134	-7.582	-4.8	22.4
AS-0143	Ent.2	144	Eagle	Phalange	Yes	56.50	6.22	14	40.66	2.8977	3.38	0.17	3.00	7.8748	-15.291	-6.0	25.2
AS-0144	Ent.2	165.1	Eagle	Phalange	Yes	58.40	5.35	15	41.78	2.7907	3.26	0.23	2.78	5.239	-16.119	-6.7	24.5

Table H.1 Continued

Lab #	Burial	Ele #	Animal	Element	Comp.	Collagen weight	% Yield	%N	%C	C:N Raw	C:N (12/14)	C/P	IR-SF	15 N_{col}	$13C_{col}$	$13C_{ap}$	$18O_{ap}$
AS-0145	Ent.2	167	Felid	Cranium	Yes	10.30	1.37	12.4	36.39	2.9365	3.43	0.09	3.21	7.7346	-14.367	-8.2	25.4
AS-0146	Ent.2	167	Felid	MC II	Yes	10.50	2.02	14.4	41.13	2.8504	3.33	0.09	3.53	7.1758	-14.347	-7.8	25.5
AS-0147	Ent.2	191	Eagle	Phalange	Yes	6.30	1.10	14	39.53	2.8179	3.29	0.13	3.12	6.3003	-16.608	-8.6	18.5
AS-0148	Ent.2	196	Eagle	Phalange	Yes	57.60	5.34	15	41.53	2.7734	3.24	0.17	2.90	5.9701	-17.437	-7.5	24.9
AS-0149	Ent.2	213.2	Lag.	Vertebra	No	6.70	5.53	10.6	33.48	3.146	3.67	0.13	3.09	3.0837	-17.554	-9.3	25.8
AS-0150	Ent.2	213.2	Lag.	Femur	Yes	12.90	5.76	14.6	41.44	2.8372	3.31	0.10	3.65	3.4324	-16.734	-9.2	22.6
AS-0151	Ent.2	270	Felid	Cranium	No	22.60	3.14	15.1	42.06	2.7858	3.25	0.05	3.55	8.6793	-16.737	-10.8	26.8
AS-0152	Ent.2	283.1	Eagle	Phalange	Yes	52.70	6.83	14.8	41.47	2.794	3.26	0.22	2.90	8.9507	-13.105	-5.4	25.3
AS-0153	Ent.2	309.1	Eagle	Phalange	Yes	233.30	20.35	17.7	53.93	3.0275	3.56	0.31	2.82	8.5547	-15.588	-7.0	24.9
AS-0154	Ent.6	1818.2	Lag.	Tibia	No	26.70	24.25	14.9	41.26	2.7764	3.24	0.33	2.60	5.7586	-15.289	-5.5	22.6
AS-0155	Ent.6	1959	Canid	Cranium	No	98.60	10.30	15.1	41.47	2.7539	3.21	0.17	2.84	7.9596	-16.464	-11.2	22.4
AS-0156	Ent.6	1991.2	Lag.	Tibia	No	18.70	10.25	14.7	41.56	2.8342	3.31	0.22	2.76	6.146	-15.978	-6.3	25.2
AS-0157	Ent.6	2069.2	Lag.	Femur	No	19.10	13.27	14.6	40.85	2.8029	3.27	0.18	3.14	6.9344	-12.843	-6.6	27.2
AS-0158	Ent.6	2072	Canid	Cranium	No	132.00	14.09	16.60	47.15	2.84	3.31	0.19	3.07	5.848	-18.576	-10.5	24.5
AS-0159	Ent.6	2079	Canid	Cranium	No	7.50	2.16	13.37	39.92	2.99	3.48	0.08	3.24	5.959	-19.488	-10.2	23.8
AS-0160	Ent.6	2194	Canid	Cranium	No	17.20	1.57	1.79	6.45	3.60	4.20	0.05	3.41	6.893	-19.610	-11.6	23.0
AS-0161	Ent.6	2199	Canid	Tibia	Yes	186.80	16.33	16.35	46.37	2.84	3.31	0.19	3.10	10.944	-9.791	-4.3	24.3
As-0162	Ent.6	2199	Canid	Cranium	Yes	21.10	1.84	0.54	2.56	4.75	5.54	0.05	3.42	11.124	-14.259	-4.8	23.4
AS-0163	Ent.6	2224	Canid	Cranium	No	31.30	2.62	2.55	8.03	3.15	3.67	0.09	3.35	9.177	-14.056	-7.5	26.0
AS-0188	Ent.2	283.2	Lag.	Ulna	No	3.60	14.06	8.08	28.58	3.54	4.12	0.12	2.82	5.595	-15.900	-6.7	27.6
AS-0189	Ent.2	309.2	Lag.	Humero	No	5.00	3.13	8.15	26.63	3.27	3.81	0.07	3.23	5.008	-14.679	-6.6	25.2
AS-0190	Ent. 3	560	Felid	Cranium	No	2.00	0.20	4.33	20.79	4.80	5.60	0.06	3.57	8.750	-19.142	-13.1	25.2
AS-0191	Ent. 3	570	Canid	Cranium	No	5.10	0.48	11.83	34.90	2.95	3.44	0.08	3.20	8.335	-17.477	-12.4	22.9
AS-0192	Ent. 3	575	Canid	Cranium	No	9.00	1.24					0.07	3.66			-13.7	20.9
AS-0193	Ent. 3	579.1	Canid	Cranium	No	9.40	1.87	11.54	36.93	3.20	3.73	0.09	3.39	8.183	-18.268	-9.5	24.0
AS-0194	Ent. 3	597.1	Canid	Cranium	No	-2.10	-0.26	3.66	18.99	5.19	6.06	0.05	3.63	6.570	-20.678	-13.3	24.5
AS-0195	Ent. 3	597.1	Canid	Cranium	No	3.80	0.68	0.82	9.93	12.11	14.13	0.06	3.19	10.645	-21.163	-2.5	23.9
AS-0196	Ent. 3	606	Canid	Cranium	No	0.00	0.00	0.67	10.84	16.14	18.83	0.07	3.41	3.358	-26.912	-13.9	23.8
AS-0197	Ent. 3	620.1	Felid	Cranium	No	3.60	2.18	9.36	29.73	3.18	3.71	0.06	3.44	7.629	-16.092	-2.4	22.9
AS-0198	Ent. 3	642	Canid	Mand	No	6.40	1.50	1.50	18.95	12.64	14.75	0.10	3.14	5.709	-28.298	-11.7	21.6

Table H.1 Continued

Lab #	Burial	Ele #	Animal	Element	Comp.	Collagen weight	% Yield	%N	%C	C:N Raw	C:N (12/14)	C/P	IR-SF	15 N_{col}	$13C_{col}$	$13C_{ap}$	$18O_{ap}$
AS-0199	Ent. 5	1382	Felid	Cranium	No	-0.80	-0.21	5.79	22.77	3.93	4.59	0.04	3.12	8.788	-20.348	-15.1	24.9
AS-0200	Ent. 5	1505	Felid	Cranium	No	2.70	0.95	0.53	9.91	18.56	21.65	0.07	3.33	4.817	-26.232	-14.3	24.4
AS-0201	Ent. 5	1587.1	Felid	Cranium	No	6.20	0.68	4.57	31.88	6.98	8.14	0.08	3.15	7.340	-19.279	-13.3	23.5
AS-0202	Ent. 5	1639	Felid	Cranium	Yes	2.80	0.54	4.47	30.58	6.84	7.98	0.07	3.09	6.379	-17.318	-4.6	23.0
AS-0203	Ent.2	270	Felid	Pm4 superior	No	-	-	-	-	-	-	-	-	-	-	-12.9	26.7
AS-0204	Ent.2	213.1	Canid	I3 superior	Yes	-	-	-	-	-	-	-	-	-	-	-9.9	24.0
AS-0205	Ent.2	143	Felid	Pm3 superior	Yes	-	-	-	-	-	-	-	-	-	-	-2.0	25.2
AS-0206	Ent.2	143	Felid	I3 superior	Yes	-	-	-	-	-	-	-	-	-	-	-2.1	25.8
AS-0207	Ent.6	1959	Canid	M1 inferior	No	-	-	-	-	-	-	-	-	-	-	-10.0	26.2
AS-0208	Ent.2	213.1	Canid	M1 Inferior	Yes	-	-	-	-	-	-	-	-	-	-	-10.6	24.6
AS-0209	Ent.2	154	Felid	Pm3 superior	Yes	-	-	-	-	-	-	-	-	-	-	-1.8	24.8
AS-0210	OF2	209	Canid	M1 inferior	No	-	-	-	-	-	-	-	-	-	-	-4.7	24.5
AS-0211	OF2	1, 309, 3	Felid	Pm4 superior	No	-	-	-	-	-	-	-	-	-	-	-11.1	25.8
AS-0236	Ent. 3	560	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-13.1	26.0
AS-0237	Ent. 3	571	Felid	I2 superior	No	-	-	-	-	-	-	-	-	-	-	-14.9	26.0
AS-0238	Ent. 3	571	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-15.2	26.8
AS-0239	Ent.6	1818.1	Felid	Pm3 superior	Yes	-	-	-	-	-	-	-	-	-	-	-3.8	26.6
AS-0240	Ent.6	8.2 u 18	Lag.	Molar/premolar	No	-	-	-	-	-	-	-	-	-	-	-3.9	27.8
AS-0241	Ent.6	1887	Felid	I3 superior	Yes	-	-	-	-	-	-	-	-	-	-	-7.3	28.2

Table H.1 Continued

Lab #	Burial	Ele #	Animal	Element	Comp.	Collagen weight	% Yield	%N	%C	C:N Raw	C:N (12/14)	C/P	IR-SF	15 N_{col}	$13C_{col}$	$13C_{ap}$	$18O_{ap}$
AS-0242	Ent.6	1887	Felid	Pm3 superior	Yes	-	-	-	-	-	-	-	-	-	-	-5.6	26.9
AS-0243	Ent.6	1941	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-12.1	27.2
AS-0244	Ent.6	1941	Felid	I3 superior	No	-	-	-	-	-	-	-	-	-	-	-12.2	27.2
AS-0245	Ent.6	1984	Felid	I3 superior	Yes	-	-	-	-	-	-	-	-	-	-	-6.0	27.1
AS-0246	Ent.6	1984	Felid	Pm4 superior	Yes	-	-	-	-	-	-	-	-	-	-	-5.1	25.3
AS-0247	Ent.6	1991.1	Felid	Pm4 superior	Yes	-	-	-	-	-	-	-	-	-	-	-8.1	25.4
AS-0248	Ent.6	2068	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-5.4	24.6
AS-0249	Ent.6	2072	Canid	M2 inferior	No	-	-	-	-	-	-	-	-	-	-	-11.5	24.6
AS-0250	Ent.6	2079	Canid	M1 inferior	No	-	-	-	-	-	-	-	-	-	-	-12.1	22.9
AS-0251	Ent.6	2194	Canid	M2 inferior	No	-	-	-	-	-	-	-	-	-	-	-13.1	22.9
AS-0252	Ent.6	2195	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-9.5	25.6
AS-0253	Ent.6	2199	Canid	M1 inferior	Yes	-	-	-	-	-	-	-	-	-	-	-3.3	26.1
AS-0254	Ent.6	2199	Canid	I3 inferior	Yes	-	-	-	-	-	-	-	-	-	-	-4.3	26.3
AS-0255	Ent.6	2224	Canid	M1 inferior	No	-	-	-	-	-	-	-	-	-	-	-10.1	27.2
AS-0256	Ent.6	2244	Canid	M1 inferior	No	-	-	-	-	-	-	-	-	-	-	-12.5	24.6
AS-0257	Ent.6	2245	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-12.4	29.1
AS-0258	Ent.6	N4-31	Felid	I3 superior	No	-	-	-	-	-	-	-	-	-	-	-13.2	28.9

Table H.1 Continued

Lab #	Burial	Ele #	Animal	Element	Comp.	Collagen weight	% Yield	%N	%C	C:N Raw	C:N (12/14)	C/P	IR-SF	15 N_{col}	$13C_{col}$	$13C_{ap}$	$18O_{ap}$
AS-0259	Ent.6	N4-31	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-11.8	28.8
AS-0287	Ent. 3	570	Canid	M2 inferior	No	-	-	-	-	-	-	-	-	-	-	-13.2	22.9
AS-0288	Ent. 3	572	Canid	M1 inferior	No	-	-	-	-	-	-	-	-	-	-	-10.0	25.8
AS-0289	Ent. 3	573.1	Canid	M1 inferior	No	-	-	-	-	-	-	-	-	-	-	-13.3	24.1
AS-0290	Ent. 3	575	Canid	M1 inferior	No	-	-	-	-	-	-	-	-	-	-	-13.3	22.1
AS-0291	Ent. 3	579.1	Canid	M2 inferior	No	-	-	-	-	-	-	-	-	-	-	-11.2	25.7
AS-0292	Ent. 3	597.1	Canid	M1 inferior	No	-	-	-	-	-	-	-	-	-	-	-12.8	25.3
AS-0293	Ent. 3	606	Canid	M2 inferior	No	-	-	-	-	-	-	-	-	-	-	-13.0	21.8
AS-0294	Ent. 3	620.1	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-10.6	25.1
AS-0295	Ent. 3	632.1	Felid	Pm4 superior	No	-	-	-	-	-	-	-	-	-	-	-14.4	24.4
AS-0296	Ent. 3	632.2	Felid	Canino inferior	No	-	-	-	-	-	-	-	-	-	-	-14.3	24.5
AS-0297	Ent. 3	642	Canid	Pm4 superior	No	-	-	-	-	-	-	-	-	-	-	-13.4	24.0
AS-0298	Ent. 5	1381.1	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-15.5	27.8
AS-0299	Ent. 5	1382.1	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-13.3	27.4
AS-0300	Ent. 5	1382.3	Felid	M1 inferior	No	-	-	-	-	-	-	-	-	-	-	-14.6	23.8

Table H.1 Continued

Lab #	Burial	Ele #	Animal	Element	Comp.	Collagen weight	% Yield	%N	%C	C:N Raw	C:N (12/14)	C/P	IR-SF	15 N_{col}	13C_{col}	13C_{ap}	18O_{ap}
AS-0301	Ent. 5	1500	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-12.1	28.7
AS-0302	Ent. 5	1505	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-13.6	24.2
AS-0303	Ent. 5	1508	Canid	M1 inferior	No	-	-	-	-	-	-	-	-	-	-	-12.8	24.5
AS-0304	Ent. 5	1587.1	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-11.9	27.7
AS-0305	Ent. 5	1587.2	Felid	Pm3 superior	No	-	-	-	-	-	-	-	-	-	-	-13.8	25.0
AS-0306	Ent. 5	1636.2	Canid	I3 inferior	Yes	-	-	-	-	-	-	-	-	-	-	-10.3	25.7
AS-0307	Ent. 5	1636.2	Canid	M1 inferior	Yes	-	-	-	-	-	-	-	-	-	-	-10.8	25.3
AS-0308	Ent. 5	1639	Felid	Pm3 superior	Yes	-	-	-	-	-	-	-	-	-	-	-3.3	28.6